

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

Transport Assessment (TR-001-000)

Part 5: London assessment

Traffic and transport

November 2013

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Department for Transport

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A report prepared for High Speed Two (HS2) Limited.

High Speed Two (HS2) Limited,
Eland House,
Bressenden Place,
London SW1E 5DU

Details of how to obtain further copies are available from HS2 Ltd.

Telephone: 020 7944 4908

General email enquiries: HS2enquiries@hs2.org.uk

Website: www.hs2.org.uk

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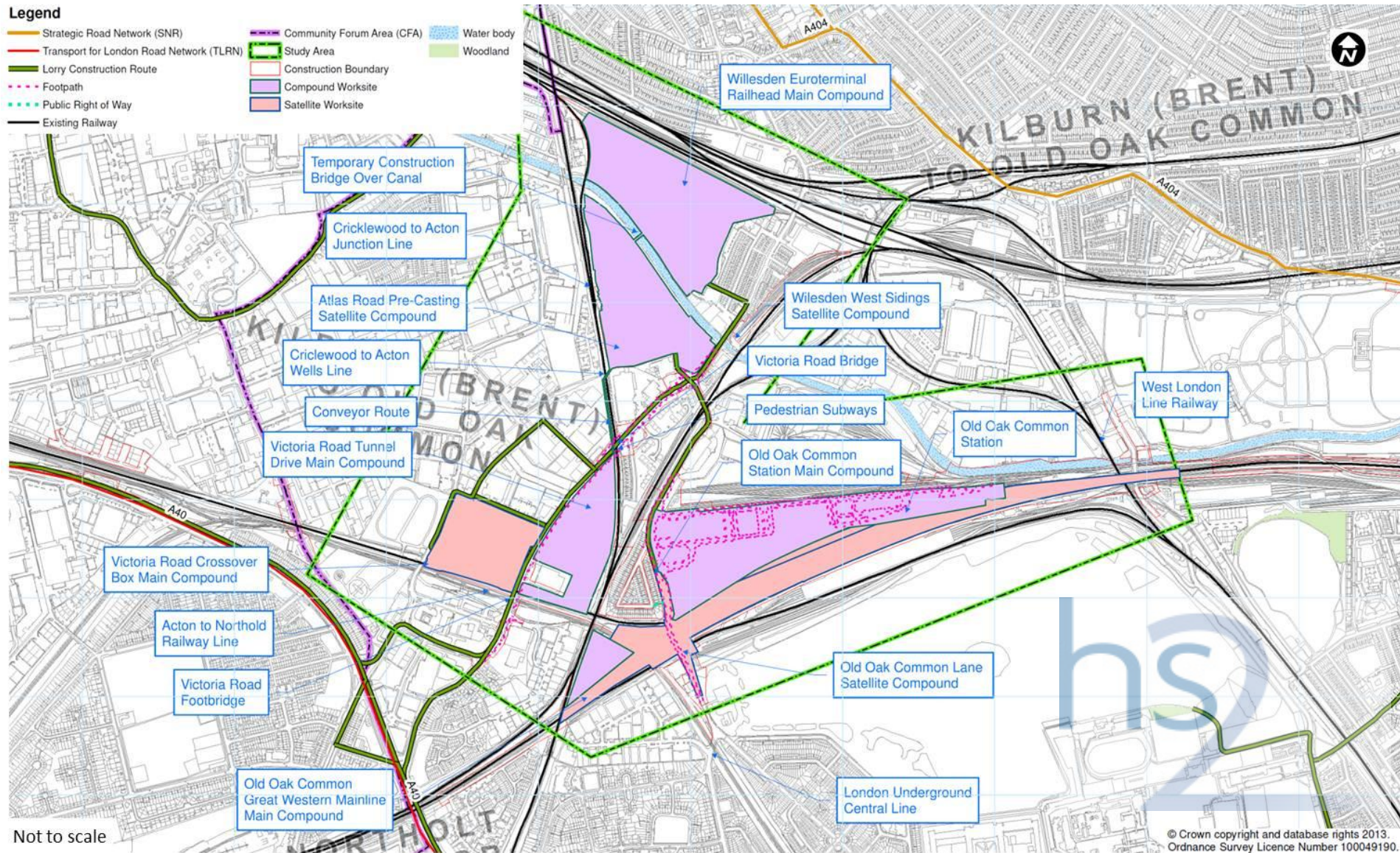
6 London assessment

6.7 Kilburn (Brent) to Old Oak Common (CFA4)

Kilburn (Brent) to Old Oak Common (CFA4) Proposed Scheme description

- 6.7.1 This section describes the main features of the Proposed Scheme in the Kilburn (Brent) to Old Oak Common area (CFA4), including the main environmental mitigation measures.
- 6.7.2 In general, features are described from south to north along the route (and east to west for features that cross HS2).
- 6.7.3 CFA4 extends over some 5.4km from the A5 Kilburn High Road in the east to the B4492 Park Royal Road in the west, and encompasses the planned new station at Old Oak Common, with the tunnel portals for the Euston tunnels to the east and the Northolt tunnels to the west. There will be a new station at Old Oak Common, which will form a key element of the transport network in west London and links to numerous local and regional rail services.
- 6.7.4 The Primrose Hill to Kilburn (Camden) (CFA3) section of the Proposed Scheme lies to the east and the Northolt Corridor (CFA5) lies to the west.
- 6.7.5 Key permanent features of this section are shown on Maps CT-06-006 to CT-06-009 (Volume 2, Map Book 4) and may be summarised as:
- the Euston twin-bore tunnels and HS1-Hs2 link tunnel;
 - vent shaft to the Euston tunnels at Salusbury Road;
 - new Old Oak Common station, interchange and associated off site highway works;
 - Victoria Road Crossover box and Old Oak Common linking tunnel; and
 - Northolt Tunnel running westwards from the Victoria Road crossover box.
- 6.7.6 The core study area, compounds, main road network and lorry routes for the shaft at Salusbury Road is shown in CT-05-007 and for the OOC area shown in CT-05-008 to CT-05-010 in Figure 6-185 below.

Figure 6-185: CFA4 wider area core road network, compounds & construction routes (CFA4 west)



- 6.7.7 The works at Old Oak Common involve major construction for the station and for the Euston and Northolt tunnels portals. Whilst the station and portal works are major sites, maximum use will be made of the existing adjacent Willesden railhead to move materials to and from the area.
- 6.7.8 Construction compounds within CFA4 are generally located parallel to, and to the north of the Western Avenue (A40). The A40 is on the Transport for London Road Network (TLRN). It commences from Westminster in Central London and becomes the M40 further to the west, connecting to the M25 and other destinations to the north.
- 6.7.9 The location of these CFA4 sites relative to the strategic road network is shown in Figure 6-185.
- 6.7.10 Below is a brief description of each site, including its location in relation to the Strategic Road Network where relevant, and further details on construction traffic management are set out in later sections.

Euston and HS1-HS2 link tunnels

- 6.7.11 The Euston tunnel is approximately 7.3km in overall length, of which approximately 5.4km passes beneath CFA4. The Euston tunnel will comprise two tunnel bores with one track in each.
- 6.7.12 The HS1-HS2 Link tunnel is approximately 6.3km in overall length carrying a single track, of which 5.4km passes beneath CFA4, and comprising a single-bore tunnel
- 6.7.13 Within CFA4 the tunnel sections are accessed and constructed from the Salusbury Road shaft, Old Oak Common Station, Victoria Road Tunnel Drive and Victoria Road Crossover Box construction sites.

Salusbury Road Shaft main site compound

- 6.7.14 The shaft at Salusbury Road will occupy a site currently used as a pay-and-display car park and a building currently used by London Underground Limited for staff welfare facilities. There is also a light industrial unit which is currently vacant.

Old Oak Common Station main site compound

- 6.7.15 Old Oak Common station and associated infrastructure will be constructed on the site currently occupied by the First Great Western and Heathrow Express depots. It is approximately 900m in length, bounded by the site of the future Crossrail depot to the north, Old Oak Common Lane to the west, and the Intercity Express Programme depot to the south. Figure 6-186 provides a visualisation of the proposed Old Oak Common station, surrounding public realm and road infrastructure.

Figure 6-186: Visualisation of proposed Old Oak Common station



- 6.7.16 Key features of this section, as described below, are shown on Maps CT-o6-008 and CT-o6-009 (Volume 2, CFA4 Map Book).
- 6.7.17 Old Oak Common station will contain six high speed train platforms located approximately 12.76m below ground level comprising two northbound and two southbound platforms providing domestic services, and two platforms for international services. The station will also provide an eight-platform interchange with the Great Western Main Line (GWML) and Crossrail services. Emergency exits will be provided by footbridges at the platform ends.
- 6.7.18 Vehicular and pedestrian access to the station will be from Old Oak Common Lane. This road runs southwards to the A40 and north-westwards towards Harlesden via an improved Victoria Road/Old Oak Common lane junction.
- 6.7.19 To enable better access during the construction and operation of Old Oak Common station, alterations to the existing highway network and new highway provisions will be required including lowering of Old Oak Common Lane under the GWML bridges, to provide standard headroom and enable access for double-decker buses via Old Oak Common Lane south of the station.
- 6.7.20 Following construction of the new GWML bridges over Old Oak Common Lane and the London Underground Central Line, temporary closure of Old Oak Common Lane will be required for a period of 12 months. This is necessary in order to reconstruct the foundations and abutments to facilitate road widening and improvement works, including road lowering.
- 6.7.21 There will also be further infrastructure improvements comprising;
- a new road access to the Intercity Express Programme depot from Old Oak Common Lane from the south side of the GWML;
 - a new road access to a new NR substation on land to the south of Wells House Road and the north of the GWML;
 - widening and improvements to Victoria Road to provide four traffic lanes from the

junction of Old Oak Common Lane/Old Oak Lane/Atlas Road southwards to Wales Farm Road at Gypsy Corner junction;

- construction of a new pedestrian footbridge on Victoria Road above the London Underground Central Line;
- construction of new pedestrian underpasses and associated retaining walls on either side of Victoria Road under the Cricklewood to Acton Wells Line;
- re-routing of footpath on either side of Victoria Road through the new underpasses beneath the Cricklewood to Acton Wells Line;
- modifications to junctions on Old Oak Common Lane and Victoria Road with adjoining roads, private accesses and frontages to take into account the widened roads and changes in levels at the boundaries of the road improvements; and
- new access road on the western side of Old Oak Common Lane to a Network Rail 6.6kV substation that will be relocated.

6.7.22 To facilitate the construction and operation of GWML Old Oak Common station, alterations to the existing railway network infrastructure and new infrastructure provisions will be required as follows:

- construction of new GWML bridge over Old Oak Common Lane and London Underground Central Line north of existing rail crossing;
- works to the GWML bridge over Old Oak Common Lane and London Underground Central Line as shown on Map CT-006-009 (Volume 2, CFA4 Map Book); and
- permanent realignment of GWML tracks, which will result in the severance of the Acton-Northolt Line (ANL) from the GWML.

6.7.23 The steps at the eastern end of the footpath between Wells House Road and Old Oak Common Lane will be realigned.

6.7.24 Diversion of utilities will be required as part of the works and these will be undertaken either during the enabling works phase or as part of the main works programme.

6.7.25 Further details of infrastructure improvements and programme are set out in Volume 2 Chapter 2.

Old Oak Common GWML main compound

6.7.26 This compound will be located to the southeastern end of the Old Oak common worksites and will be used to manage existing railway modification works only, as part of the GWML works at Old Oak Common.

Old Oak Common Lane underbridge satellite compound

6.7.27 This compound will be located to the southern end of the Old Oak common worksites and is associated with civil engineering works related to Old Oak Common Lane underbridge. It will be accessed via Old Oak Common Lane.

Central Line Bridge satellite site compound

- 6.7.28 This compound will be used for the demolition and replacement of the London Underground Central line bridge. It will be accessed via Old Oak Common Lane.

Atlas Road Pre-Casting satellite site compound

- 6.7.29 This compound will be used for production of the pre-cast tunnel linings for the Euston tunnel, HS1-HS2 Link tunnel and Northolt tunnel. It will be accessed via Atlas Road.

Willesden Euroterminal main site compound

- 6.7.30 This compound will be used for the temporary storage, loading and removal of excavated material by rail. The material will arise from the excavation of the Old Oak Common station box, Victoria Road crossover box and tunnels throughout the London area. The compound will also be used for supplying bulk materials for the tunnelling work throughout London and materials for railway modification works in the Euston - Station and Approach area (CFA1) and the Camden and HS1 Link area (CFA2). The compound can be accessed from Channel Gate Road via the A4000 Old Oak Lane.

Victoria Road Tunnel Drive main site compound

- 6.7.31 The main tunnel drive site is located on the east side of Victoria Road as shown in Figure 6-185 and during construction will be accessed from OOC lane and from Victoria Road.

Victoria Road Crossover Box main site compound

- 6.7.32 The Victoria Road crossover box will be located to the west of Old Oak Common station. The purpose of the crossover box is to allow trains to change tracks and reverse in and out of the station. The crossover box will be approximately 240m in length and will require widening and adjustments to Victoria Road and the junction of Victoria Road and Atlas Road. The widened Victoria Road will include a footpath/cycleway. There will be a new footpath/cycleway on a bridge west of and fixed to the existing Victoria Road bridge spanning over the London Underground Central Line and ANL.
- 6.7.33 The construction works in this location will also require the diversion of Thames Water sewer and mains utilities, National Grid gas main, BT cables, cabinets and equipment; and Scottish and Southern Electric substations and 11kV cables.
- 6.7.34 To link the Victoria Road crossover box and Old Oak Common station two small sections of tunnel known as the Old Oak Common tunnels will be constructed.

Kilburn (Brent) to Old Oak Common (CFA4) assessment methodology

- 6.7.35 The regional assessment methodology is set out in the London Regional methodology. There is no deviation from the regional methodology for this CFA. However, further details of the assessment of Old Oak Common Station interchange demands, intermodal facilities, and assessment of off-site highway impacts are set out in the operational assessment.

Kilburn (Brent) to Old Oak Common (CFA4) sensitivity analysis

- 6.7.36 The Park Royal area, encompassing Old Oak Common, is identified in the London Plan as an 'Opportunity Area' with significant capacity to accommodate new housing, commercial and other

development linked to existing or potential improvements to public transport accessibility. An Opportunity Area Planning Framework was adopted by the Mayor of London in 2011.

- 6.7.37 Annex 1 of the London Plan outlines the broad principles to be applied to the Park Royal/Willesden Junction Opportunity Area and sets out an indicative estimate of 14,000 jobs and a minimum of 1,500 new homes to 2031. This recognises that Park Royal/Willesden Junction and adjacent areas are underused and have potential for intensification.
- 6.7.38 Prompted by the proposed station at Old Oak Common for both Crossrail and HS2 trains, the Mayor of London, TfL and the three boroughs concerned (Brent, Ealing and Hammersmith & Fulham) are currently developing new planning guidance for the "Old Oak" area. This area covers the eastern end of the Park Royal Opportunity Area and extending to Wormwood Scrubbs. The new guidance will recognise the influence that the proposed station at Old Oak Common will have on the regeneration of the surrounding area and the support it offers to a planned employment growth.
- 6.7.39 A sensitivity test on rail passenger demand has been carried out incorporating the above jobs and homes estimates and is reported separately in sub-section of this London regional section.

Kilburn (Brent) to Old Oak Common (CFA4) future baseline

Key future baseline transport issues

- 6.7.40 There are no significant issues for the future baseline. Land use and transport changes affecting this CFA are modest. However the completion of Crossrail 1 in 2018 will greatly improve public transport connectivity.

Land use assumptions

- 6.7.41 The future baseline demand has been developed within the Railplan public transport passenger demand models and WeLHAM highway models, taking account of forecasts for changes to population, employment and traffic growth.

Transport supply assumptions

Rail

- 6.7.42 Transport movements in this area will be affected by the completion of the western section of the Crossrail route from Paddington in west London to Heathrow Airport and Maidenhead, due to commence operation in 2018. The 13 stations on the route will undergo a number of enhancements to facilitate the new Crossrail services, which will run at surface, west of Paddington, providing an enhancement to existing train services at Acton Main Line, and to a lesser extent (as distance from the HS2 route increases) at Ealing Broadway, Hanwell and Southall Stations.
- 6.7.43 No further changes in rail transport supply are anticipated other than those above.

Highway network

- 6.7.44 No major changes to the highway network are planned.
- 6.7.45 Crossrail will involve relatively minor highway works in the vicinity of the stations to improve pedestrian access. Given the existing public transport options in the area, the impact is likely to be limited to increased pedestrian movements at the stations

Local bus and coach services

- 6.7.46 Crossrail may give rise to amendments to the bus network in the proximity of stations it serves the closest to the HS2 stations being Acton mainline. In so far as these are defined, these have been considered in the Regional Railplan assessments, and also incorporated in the WeLHAM based highway assessments.
- 6.7.47 Further local public transport improvements include limited enhancements to bus services, and minor access and congestion relief schemes at a number of rail and underground stations in the area which will have very local impact.

Public transport interchanges

- 6.7.48 There are no further proposed changes to public transport interchanges that will affect the future baseline in CFA4.

Traffic growth assumptions

- 6.7.49 Individual construction activities have been assessed against 2021 baseline traffic flows, irrespective of when they occur during the construction period. Future baseline traffic volumes in the peak hours are forecast to grow by 2.5-3% by 2021 in this area, compared to 2012.
- 6.7.50 Future baseline traffic volumes in the peak hours are forecast to grow by 4.5-5.5% by 2026 compared to 2012.
- 6.7.51 Future baseline traffic volumes in the peak hours are forecast to grow by 8.5-9.5 % by 2041 compared to 2012.
- 6.7.52 As well as forecast background highway traffic growth incorporated within the preliminary WeLHAM model for the area, background rail passenger demand in the area is forecast to increase, partially as a result of Crossrail and other schemes becoming operational. There is expected to be only limited background growth in bus passenger numbers other than that arising from Crossrail.

Strategic and local road network traffic flows

- 6.7.53 Traffic flows on strategic and local roads are set out in Table 6-218 and Table 6-219 below for Baseline (2012), construction baseline (2021), HS2 Phase 1 operation (2026), and HS2 phase 2 operations (2041). This shows growth on links that intercept the HS2 route corridor. For comparative purposes, this table also shows the links that are in CFA5 and CFA6.

Table 6-218: AM peak hour future baseline traffic flows on key strategic and local roads (demand flows)

Location	Direction	2012 baseline		2021 future baseline		2026 future baseline		2041 future baseline		All vehicles change from 2012			All vehicle % change from 2012		
		All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
CFA ₄															
Kilburn High Road (south of Belsize Road)	NB	657	79	639	82	653	68	666	68	-17	-4	9	-3%	-1%	1%
	SB	202	47	203	48	209	48	201	47	2	8	-1	1%	4%	0%
Salisbury Road (north of Premier Corner)	NB	462	10	511	10	503	9	525	10	49	40	63	11%	9%	14%
	SB	413	9	479	11	475	10	481	11	67	62	68	16%	15%	16%
Premier Corner (north of Kilburn Lane)	NB	966	55	975	58	976	58	1,009	58	9	10	43	1%	1%	4%
Chamberlayne Road (north of Kilburn Lane)	NB	327	58	351	60	371	63	396	64	23	44	69	7%	13%	21%
	SB	376	73	479	78	485	79	489	79	102	109	113	27%	29%	30%
Harrow Road (west of College Road)	WB	568	30	406	25	422	24	454	25	-162	-147	-114	-28%	-26%	-20%
	EB	382	44	356	45	368	44	381	44	-26	-14	-1	-7%	-4%	0%
Scrubs Lane (north of Hythe Road)	NB	489	34	381	33	400	34	434	37	-108	-89	-55	-22%	-18%	-11%
	SB	783	65	735	62	767	60	804	60	-48	-16	20	-6%	-2%	3%
Old Oak Common Lane (north of Wulfstan Street)	NB	262	31	243	27	240	27	248	26	-19	-22	-14	-7%	-8%	-5%
	SB	380	28	413	29	460	30	485	34	33	80	105	9%	21%	28%
Old Oak Common Lane (south of Du Cane Road)	NB	653	37	628	36	586	37	592	38	-26	-67	-62	-4%	-10%	-9%
	SB	339	33	343	32	343	32	354	36	4	5	16	1%	1%	5%
Wales Farm Road	SB	1,170	146	1,072	144	1,117	142	1,200	140	-98	-53	30	-8%	-5%	3%
Victoria Road (north of Park Royal Road)	NB	1,042	130	990	118	1,098	116	1,172	117	-52	55	130	-5%	5%	12%
Park Royal Road	NB	375	35	433	35	442	39	456	39	58	67	82	15%	18%	22%
	SB	328	64	336	62	340	62	349	62	8	12	21	3%	4%	6%
CFA ₅															
Coronation Road	EB	239	14	228	14	238	14	255	15	-11	-1	16	-5%	0%	7%
	WB	51	10	33	10	34	10	36	10	-18	-17	-15	-35%	-33%	-30%
Connell Crescent bridge	EB	347	7	345	8	370	8	399	8	-2	23	52	-1%	7%	15%
	WB	15	0	15	0	15	0	15	0	0	0	0	0%	-2%	0%

Location	Direction	2012 baseline		2021 future baseline		2026 future baseline		2041 future baseline		All vehicles change from 2012			All vehicle % change from 2012		
		All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
Hanger Lane East Bridge	SB	5,129	299	5,034	304	5,055	304	5,181	304	-95	-74	52	-2%	-1%	1%
Hanger Lane West Bridge	NB	4,617	249	4,516	236	4,639	237	4,785	241	-101	22	167	-2%	0%	4%
Alperton Lane	NB	496	1	548	1	551	1	532	1	52	55	36	10%	11%	7%
	SB	347	37	368	38	382	37	422	38	21	35	75	6%	10%	22%
Bideford Avenue	NB	354	10	309	10	311	10	331	10	-45	-43	-23	-13%	-12%	-6%
	SB	439	27	432	27	422	26	443	26	-8	-17	4	-2%	-4%	1%
Horsenden Lane	NB	246	8	245	8	249	8	244	8	-1	3	-3	-1%	1%	-1%
	SB	260	23	255	23	257	24	260	24	-5	-3	0	-2%	-1%	0%
Greenford Road (north of Uneeda Drive)	NB	417	15	420	16	417	16	446	16	3	-1	29	1%	0%	7%
	SB	554	8	541	8	548	8	563	9	-13	-6	9	-2%	-1%	2%
Greenford Road (south of Uneeda Drive)	NB	834	84	821	86	823	83	857	80	-13	-11	23	-2%	-1%	3%
	SB	862	66	851	65	856	65	867	65	-11	-7	5	-1%	-1%	1%
Oldfield Lane (north of Uneeda Drive)	NB	317	19	316	19	344	19	402	20	-1	27	85	0%	9%	27%
	SB	676	24	633	23	627	24	660	24	-44	-49	-16	-6%	-7%	-2%
Mandeville Road (north of Eastcote Lane)	NB	1,253	42	1,245	42	1,244	41	1,268	41	-7	-8	16	-1%	-1%	1%
	SB	838	44	832	35	831	35	843	35	-5	-7	5	-1%	-1%	1%
Mandeville Road (south of Eastcote Lane)	NB	1,131	58	1,137	60	1,166	59	1,226	58	7	35	95	1%	3%	8%
	SB	1,012	60	1,005	51	999	51	1,017	52	-8	-13	5	-1%	-1%	1%
Eastcote Lane	EB	659	13	651	13	655	14	666	13	-8	-4	7	-1%	-1%	1%
	WB	322	12	322	12	342	12	358	12	0	20	37	0%	6%	11%
CFA6															
West End Road	NB	699	55	685	43	674	30	686	29	-14	-25	-13	-2%	-4%	-2%
	SB	556	27	528	28	491	26	498	22	-28	-65	-58	-5%	-12%	-10%
Ickenham Road	NB	803	26	748	25	737	26	823	27	-55	-66	20	-7%	-8%	2%
	SB	1,163	86	1,122	72	1,146	63	1,183	71	-41	-16	21	-4%	-1%	2%
Breakspear Road	NB	542	14	561	14	553	14	516	14	19	11	-26	3%	2%	-5%
	SB	670	16	669	18	667	18	701	19	-1	-3	30	0%	0%	5%

Location	Direction	2012 baseline		2021 future baseline		2026 future baseline		2041 future baseline		All vehicles change from 2012			All vehicle % change from 2012		
		All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
Harvil Road	NB	332	22	335	22	336	19	340	19	4	4	9	1%	1%	3%
	SB	440	17	471	16	509	17	466	17	30	69	26	7%	16%	6%
Swakeleys Road (south)	NB	1,663	89	1,642	89	1,619	87	1,689	88	-22	-44	26	-1%	-3%	2%
	SB	1,577	136	1,574	123	1,626	114	1,649	119	-3	49	72	0%	3%	5%

6.7.54 Within CFA4 it can be seen that absolute flow changes are typically relatively small and these are generally reflected in small percentage changes.

Table 6-219: PM peak hour future baseline traffic flows on key strategic and local roads (demand flows)

Location	Direction	2012 baseline		2021 future baseline		2026 future baseline		2041 future baseline		All vehicles change from 2012			All vehicle % change from 2012		
		All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
CFA4															
Kilburn High Road (south of Belsize Road)	NB	553	54	543	53	552	56	613	58	-10	-1	60	-2%	0%	11%
	SB	316	46	327	46	322	46	328	46	10	5	11	3%	2%	4%
Salisbury Road (north of Premier Corner)	NB	506	5	562	7	544	7	544	7	56	38	38	11%	7%	8%
	SB	368	10	370	10	369	10	406	11	2	0	38	1%	0%	10%
Premier Corner (north of Kilburn Lane)	NB	887	34	977	38	981	38	1,005	37	90	93	118	10%	10%	13%
Chamberlayne Road (north of Kilburn Lane)	NB	534	65	639	66	646	66	664	67	105	112	130	20%	21%	24%
	SB	485	50	486	51	488	51	499	50	1	2	14	0%	0%	3%
Harrow Road (west of College Road)	WB	624	35	541	27	550	27	579	28	-83	-74	-46	-13%	-12%	-7%
	EB	542	23	409	22	440	22	470	22	-134	-102	-73	-25%	-19%	-13%
Scrubs Lane (north of Hythe Road)	NB	973	51	897	40	946	38	1,008	40	-76	-27	35	-8%	-3%	4%
	SB	507	31	465	24	462	26	506	28	-42	-45	-1	-8%	-9%	0%
Old Oak Common Lane (north of Wulfstan Street)	NB	340	32	398	29	408	30	424	33	58	67	84	17%	20%	25%
	SB	225	16	231	16	223	15	214	15	6	-2	-11	3%	-1%	-5%

Location	Direction	2012 baseline		2021 future baseline		2026 future baseline		2041 future baseline		All vehicles change from 2012			All vehicle % change from 2012		
		All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
Old Oak Common Lane (south of Du Cane Road)	NB	329	26	336	26	331	26	328	26	7	2	-1	2%	1%	0%
	SB	434	25	437	25	440	25	458	25	4	7	25	1%	2%	6%
Wales Farm Road	SB	1,136	57	1,175	55	1,261	56	1,364	60	39	125	228	3%	11%	20%
Victoria Road (north of Park Royal Road)	NB	890	50	826	45	847	46	901	47	-64	-43	11	-7%	-5%	1%
Park Royal Road	NB	325	39	358	41	376	44	397	45	33	51	72	10%	16%	22%
	SB	412	25	399	24	417	24	434	24	-14	5	21	-3%	1%	5%

CFA5

Coronation Road	EB	135	12	123	12	128	11	136	12	-12	-8	1	-9%	-6%	1%
	WB	80	10	62	10	65	10	67	10	-19	-15	-14	-23%	-18%	-17%
Connell Crescent bridge	EB	129	3	135	5	140	3	147	5	6	11	18	5%	8%	14%
	WB	79	0	45	0	45	0	47	0	-34	-33	-32	-43%	-43%	-41%
Hanger Lane East Bridge	SB	4,749	146	4,648	145	4,746	145	4,867	146	-101	-3	118	-2%	0%	2%
Hanger Lane West Bridge	NB	4,778	142	4,667	146	4,832	148	5,074	145	-111	53	295	-2%	1%	6%
Alperton Lane	NB	369	1	369	0	400	0	424	0	0	32	55	0%	9%	15%
	SB	287	1	286	2	318	2	353	2	-2	30	66	-1%	11%	23%
Bideford Avenue	NB	240	7	232	7	234	8	240	9	-8	-6	1	-3%	-2%	0%
	SB	692	24	687	24	682	24	691	24	-5	-10	-1	-1%	-1%	0%
Horsenden Lane	NB	321	14	302	13	321	13	334	14	-18	0	13	-6%	0%	4%
	SB	304	8	298	8	297	8	299	8	-6	-7	-5	-2%	-2%	-2%
Greenford Road (north of Uneeda Drive)	NB	550	2	481	3	517	2	553	3	-69	-33	3	-13%	-6%	1%
	SB	496	2	495	2	499	2	508	3	-1	3	12	0%	1%	2%
Greenford Road (south of Uneeda Drive)	NB	999	36	995	38	995	37	1021	37	-4	-4	21	0%	0%	2%
	SB	955	40	947	40	948	40	962	40	-8	-7	6	-1%	-1%	1%
Oldfield Lane (north of Uneeda Drive)	NB	631	17	592	17	618	17	641	17	-39	-13	10	-6%	-2%	2%
	SB	482	13	480	13	484	13	495	13	-2	2	14	0%	0%	3%
Mandeville Road (north of Eastcote Lane)	NB	1,222	26	1,239	26	1,183	26	1,166	26	17	-39	-57	1%	-3%	-5%
	SB	818	21	826	22	830	21	827	20	8	12	9	1%	1%	1%

Location	Direction	2012 baseline		2021 future baseline		2026 future baseline		2041 future baseline		All vehicles change from 2012			All vehicle % change from 2012		
		All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	All vehicles	HGV & buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
Mandeville Road (south of Eastcote Lane)	NB	1,500	32	1,519	31	1,473	32	1,447	35	19	-27	-53	1%	-2%	-4%
	SB	503	33	502	33	506	33	515	32	0	4	12	0%	1%	2%
Eastcote Lane	EB	669	9	634	8	635	8	645	8	-35	-34	-24	-5%	-5%	-4%
	WB	489	10	459	10	490	10	527	11	-31	0	37	-6%	0%	8%

CFA6

West End Road	NB	915	10	872	10	870	11	898	10	-43	-44	-16	-5%	-5%	-2%
	SB	630	10	620	10	616	10	620	10	-10	-14	-10	-2%	-2%	-2%
Ickenham Road	NB	1,108	23	1,087	23	1,100	23	1,125	24	-22	-8	17	-2%	-1%	2%
	SB	955	21	944	21	912	21	949	22	-12	-43	-7	-1%	-5%	-1%
Breakspear Road	NB	755	8	754	8	768	8	750	9	-1	12	-6	0%	2%	-1%
	SB	482	9	490	10	544	10	601	12	8	62	119	2%	13%	25%
Harvil Road	NB	378	16	387	16	387	16	460	16	9	9	81	2%	2%	21%
	SB	440	9	428	9	449	9	488	9	-12	9	48	-3%	2%	11%
Swakeleys Road (south)	NB	1,453	137	1,455	137	1,460	134	1,509	135	2	7	56	0%	1%	4%
	SB	1,343	79	1,337	79	1,377	75	1,457	77	-6	35	115	0%	3%	9%

6.7.55 As for the AM peak hour, the table shows that flow changes in the PM peak hour are relatively small within CFA4, and these are generally reflected in small percentage changes. Where there are large percentage changes, these are still relatively small numbers but on a low base. The variability in the numbers is a reflection of the modelled impact of congestion.

Junction performance

6.7.56 The operation of junctions in the proximity of the proposed interventions in the existing and future baseline is described and shown in the following paragraphs and tables.

Salisbury Road / Carlton Vale / Fernhead Road

6.7.57 The model shows that the junction operates comfortably within capacity during both AM and PM peak hours in all modelled periods.

Table 6-220: Forecast baseline performance at Salusbury Road / Carlton Vale / Fernhead Road (priority junction)

CFA4	2012			2021			2026			2041		
AM peak (08:00-09:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Salusbury Road	993	18	0	1,028	18	0	1,033	18	0	1049	19	0
Carlton Vale	362	9	0	354	9	0	376	9	0	416	10	0
Fernhead Road	293	35	0	306	39	0	305	39	0	309	41	0
	2012			2021			2026			2041		
PM peak (17:00-18:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Salusbury Road	766	14	0	790	14	0	810	15	0	871	16	0
Carlton Vale	470	12	0	463	12	0	473	12	0	468	12	0
Fernhead Road	348	45	0	373	49	0	359	47	0	351	46	0

Premier Corner / Kilburn Lane

6.7.58 The model shows that the junction operates comfortably within capacity during both AM and PM peak hours in all modelled periods.

Table 6-221: Forecast baseline performance at Premier Corner / Kilburn Lane (priority junction)

CFA4	2012			2021			2026			2041		
AM peak (08:00-09:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Kilburn Lane (WB)	759	13	0	796	14	0	818	14	0	863	15	0
Premier corner (1 way outbound *)	*	*	*	*	*	*	*	*	*	*	*	*
Kilburn Lane (EB)	379	39	0	369	39	0	366	39	0	374	39	0
	2012			2021			2026			2041		
PM peak (17:00-18:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Kilburn Lane (WB)	922	16	0	947	16	0	941	16	0	931	16	0
Premier corner (1 way outbound *)	*	*	*	*	*	*	*	*	*	*	*	*
Kilburn Lane (EB)	276	30	0	357	34	0	376	35	0	395	36	0

Salusbury Road / Brondesbury Road / Harvist Road

6.7.59 The model shows that the junction operates comfortably within capacity during both AM and PM peak hours in all modelled periods.

Table 6-222: Forecast baseline performance at Salusbury Road / Brondesbury Road / Harvist Road (signals)

CFA4	2012			2021			2026			2041		
AM peak (08:00-09:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Salusbury Road (SB)	367	60	7	379	59	7	376	59	7	366	58	6
Brondesbury Road	126	15	2	139	17	3	141	17	3	161	19	3
Salusbury Road (NB)	472	56	9	522	59	9	512	58	9	535	60	9
Harvist Road	199	30	4	196	31	4	205	32	4	209	33	4
	2012			2021			2026			2041		
PM peak (17:00-18:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Salusbury Road (SB)	344	45	5	340	43	5	340	43	5	364	46	5
Brondesbury Road	111	17	2	113	19	2	115	19	2	117	19	2
Salusbury Road (NB)	511	40	8	569	44	9	551	43	9	552	45	9
Salusbury Road (NB)	173	32	3	135	26	3	141	28	3	173	34	3

Harrow Road / Scrubs Lane

6.7.60 The model shows that the junction operates within capacity during both AM and PM peak hours in all modelled periods.

Table 6-223: Forecast baseline performance at Harrow Road / Scrubs Lane (signals)

CFA4	2012			2021			2026			2041		
AM peak (08:00-09:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Harrow Road (EB)	750	67	11	773	69	12	793	70	12	826	73	12
Harrow Road (WB)	745	89	11	659	78	10	667	79	10	690	81	10
Scrubs Lane	497	32	9	370	24	7	397	25	7	445	28	8
	2012			2021			2026			2041		
PM peak (17:00-18:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Harrow Road (EB)	601	70	10	615	72	10	620	72	10	663	77	11
Harrow Road (WB)	631	78	9	520	65	7	514	64	7	551	68	8
Scrubs Lane	1023	50	16	936	46	15	984	48	15	1046	51	16

Old Oak Lane / Tubbs Road

6.7.61 The model shows that the junction operates within capacity during both AM and PM peak hours in all modelled periods.

Table 6-224: Forecast baseline performance at Old Oak Lane / Tubbs Road (signals)

CFA4	2012			2021			2026			2041		
AM peak (08:00-09:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Station Road	532	45	4	497	42	3	507	42	3	530	44	4
Tubbs Road	290	72	4	222	55	3	235	58	4	261	64	4
Old Oak Lane	518	52	4	527	52	4	565	56	4	615	62	4
	2012			2021			2026			2041		
PM peak (17:00-18:00)	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue	Flow	RFC	Max queue
Station Road	449	39	3	440	38	3	461	40	3	489	42	3
Tubbs Road	338	84	5	360	89	5	384	95	6	402	99	6
Old Oak Lane	702	69	5	657	65	5	657	66	5	693	71	5

Old Oak Common Lane / Du Cane Road

6.7.62 The Old Oak Common Lane southbound approach to the junction operates at over 90% of capacity during the AM peak for all future forecast years, with only a very marginal increase in flows and degree of saturation between 2012 and 2041.

Table 6-225: Forecast baseline performance at Old Oak Common Lane / Du Cane Road (signals)

CFA4	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Old Oak Common Lane (SB)	178	92	4	179	92	4	179	92	4	181	93	4
Du Cane Road	158	31	3	167	32	3	171	33	3	184	34	4
Old Oak Common Lane (NB)	690	64	9	664	61	9	623	57	9	629	57	9
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Old Oak Common Lane (SB)	340	76	4	351	77	4	354	78	5	363	81	5
Du Cane Road	190	62	4	189	62	4	189	62	4	194	63	4
Old Oak Common Lane (NB)	355	34	4	363	35	4	357	34	4	354	34	4

Old Oak Common Lane / Western Avenue / Old Oak Road (Savoy Circus)

6.7.63 The model shows that the junction operates beyond its practical capacity in both AM and PM peak hours in the 2012 baseline, and this applies to all arms except Old Oak Common Lane northbound. This increases marginally through the scenarios up to 2041 due to the small increases in traffic flows expected.

Table 6-226: Forecast baseline performance at Old Oak Common Lane / Western Avenue / Old Oak Road (signals)

CFA ₄	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Old Oak Common Lane (SB)	372	76	8	375	77	8	376	77	8	391	80	8
A40 West Way	2,116	73	35	2,250	78	37	2,363	81	39	2,567	88	42
Old Oak Common Lane (NB)	1,550	63	18	1,547	63	18	1,560	63	18	1,575	63	18
A40 Western Avenue (EB)	3,403	102	43	3,437	102	43	3,452	103	43	3,494	103	43
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Old Oak Common Lane (SB)	458	93	10	463	94	10	465	94	10	483	98	10
A40 West Way	2,366	93	42	2,468	96	43	2,499	99	44	2,537	100	44
Old Oak Common Lane (NB)	1,513	61	16	1,518	61	16	1,533	61	16	1,561	61	16
A40 Western Avenue (EB)	3,029	88	39	3,075	89	40	3,145	91	41	3,229	92	41

Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road

6.7.64 The model shows that the junction operates within capacity during the AM peak hour in all modelled periods, albeit with changes in the degree of saturation on the Victoria Road approach due to flow increases on that arm. In the PM peak hour the Old Oak Common Lane approach experiences modest increases in flow but this takes the degree of saturation to beyond practical capacity in all future baseline scenarios.

Table 6-227: Forecast baseline performance at Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road (signals)

CFA ₄	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Atlas Road	50	23	1	52	24	1	54	25	1	56	26	1
Old Oak Lane	707	43	8	624	38	7	638	39	7	696	42	8
Old Oak Common Lane	308	66	5	290	62	5	288	61	5	296	63	5
Victoria Road	445	29	5	538	46	6	638	55	7	700	62	8
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Atlas Road	159	73	3	145	67	3	147	68	3	153	71	3
Old Oak Lane	599	37	7	619	38	7	660	40	7	705	42	8
Old Oak Common Lane	380	84	7	411	91	7	421	93	7	439	97	8

CFA4	2012			2021			2026			2041		
Victoria Road	443	28	5	415	26	5	441	28	5	483	31	5

Bethune Road / Victoria Road

6.7.65 The model shows that the junction operates within capacity during both AM and PM peak hours in all modelled periods.

Table 6-228: Forecast baseline performance at Bethune Road / Victoria Road (priority junction)

CFA4	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Bethune Road	26	8	0	26	8	0	26	8	0	76	24	1
Victoria Road (SB)	478	36	3	393	30	2	413	32	2	449	34	3
Victoria Road (NB)	350	32	2	418	39	2	506	47	3	509	47	3
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Bethune Road	26	8	0	26	8	0	26	8	0	26	8	0
Victoria Road (SB)	487	38	3	533	42	3	605	46	4	672	50	4
Victoria Road (NB)	272	26	2	263	25	2	265	25	2	302	28	2

Western Avenue / Wales Farm Road / Leamington Park (on boundary of CFA4/CFA5)

6.7.66 The model shows that Western Avenue eastbound approach to the junction operates beyond its practical capacity in the AM peak hour in every modelled scenario, with minor increases in flows, degree of saturation and maximum queue from 2012 to 2041. Other arms in the AM peak, and all arms in the PM peak, operate within their practical capacity.

Table 6-229: Forecast baseline performance at Western Avenue / Wales Farm Road / Leamington Park (signals)

CFA4/5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Western Avenue (EB)	3230	98	36	3260	99	38	3273	99	40	3311	100	40
Wales Farm Road	1316	46	24	1215	42	22	1259	44	23	1340	46	24
Western Avenue (WB)	2586	66	31	2619	66	31	2673	68	32	2765	70	33
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Western Avenue (EB)	2784	75	26	2833	77	27	2910	79	28	2984	80	28
Wales Farm Road	1193	49	27	1229	50	28	1317	54	30	1424	58	32
Western Avenue (WB)	2999	68	35	3054	68	36	3060	68	36	3103	68	36

Friary Road / Friary Road (on boundary of CFA4/CFA5)

- 6.7.67 The model shows that the junction operates within capacity during both AM and PM peak hours in all modelled periods.

Table 6-230: Forecast baseline performance at Friary Road / Friary Road (priority junction)

CFA4/5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Friary Road (EB)	145	11	0	151	12	0	152	13	0	144	12	0
Friary Road (NB)	160	20	0	146	18	0	145	18	0	157	19	0
Friary Road (WB)	122	6	0	122	6	0	125	6	0	137	7	0
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Friary Road (EB)	64	5	0	73	6	0	69	6	0	70	6	0
Friary Road (NB)	246	24	0	248	25	0	259	26	0	271	27	0
Friary Road (WB)	149	7	0	142	7	0	140	7	0	142	7	0

Accidents and safety

- 6.7.68 Accident data for the 36 month period from April 2009 to March 2012 in the vicinity the CFA4 worksites reveals a few clusters at or near the locations of proposed worksites. The main cluster of accidents occurred along the A40 corridor to the south. The future baseline flows in the vicinity of the CFA4 construction compounds and the A40 are expected to increase at a similar rate to other locations in this area generally and the likely risk of accidents is not expected to change in these locations disproportionately as a result. No further safety issues have been identified for future network operation within CFA4 as a result of changes to the highway network or travel demands.

Parking and loading

- 6.7.69 Baseline surveys have been undertaken. No changes are anticipated in the future baseline.

Rail

- 6.7.70 Changes to the strategic rail network are described in the future baseline, and the wider regional changes are described within CFA1.
- 6.7.71 Aside from minor station access and congestion relief schemes, no further changes are proposed to the local rail or underground network.

Local bus and coach services

- 6.7.72 The local bus network may be refined following the opening of Crossrail in 2019. The impact of this on changes in overall highway travel patterns has been included in the WeLHAM modelling, and other than this there may be refinement of bus operations to access Crossrail stations on a localised basis. There are no other changes planned or considered within the assessment.

Public transport interchanges

- 6.7.73 Aside from minor station access schemes, including for Crossrail 1 stations, no changes are proposed to existing public transport interchanges in this area.

Taxis

- 6.7.74 No changes are proposed to taxi access or operational arrangements in this area in the future baseline. It is noted that Old Oak Common Lane forms the boundary between London central and outer zones.

Pedestrians and cyclists

- 6.7.75 As set out in the baseline reports, a series of pedestrian flow surveys were undertaken (in period June-Sept 2012) to assist in determining typical usage, and how these may be affected during the HS2 construction period. Within CFA4 it is expected that for the future baselines through 2021, 2026, and 2041 there will be growth of under 10% overall in pedestrian and cycle baseline flows in the weekday AM and PM peak periods, other than on the immediate approaches to Crossrail stations. It is expected that there will be growth at other periods of the day and over weekends, however these will typically be alongside lower prevailing traffic flows than experienced in the weekday peak hours.

Waterway and canals

- 6.7.76 There are no proposed changes to the canal network within the study area.

Kilburn (Brent) to Old Oak Common (CFA4) Proposed Scheme description

- 6.7.77 This section provides an overview of the construction traffic and transport impacts for the section of HS2 that passes through the Kilburn to Old Oak Common section. This CFA includes construction of a number of the main worksites for the Salusbury Road shaft, Old Oak Common Old Station and access infrastructure, and the Victoria Road crossover box.
- 6.7.78 The construction period for the whole route is programmed for 2017 to 2026. The base year for assessment of construction impacts has been chosen at 2021. The forecast peak construction activities have then been overlaid on 2021, with, as relevant, overlapping activities (in both area of importance and timing) considered in combination.

Construction activities

- 6.7.79 Details of the construction phasing are provided in Volume 2 Section 2. The main construction works and the time periods when each compound is operational are summarised in Figure 6-187.

Figure 6-187: Kilburn (Brent) to Old Oak Common (CFA4) construction activity phasing

	2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				2026				2027			
Construction activity	quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Advance works																																																
Civil engineering works																																																
Salusbury Road vent																																																
Salusbury Road vent shaft																																																
Salusbury Road auto-																																																

Construction activity	2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				2026				2027			
	quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
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Modifications to the																																																

Construction activity	2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				2026				2027																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Compounds and construction sites

6.7.80 Within this CFA there are nine construction sites:

- Salusbury Road shaft main compound
- Old Oak Common station main compound
- Oak Common GWML main compound satellite compound
- Old Oak Common Lane underbridge
- Central Line Bridge satellite compound
- Atlas Road Pre-Casting satellite compound
- Willesden Euroterminal main compound
- Victoria Road crossover box main compound
- Victoria Road tunnel drive main compound

6.7.81 Construction vehicle movements required to construct the Proposed Scheme will include the delivery of plant and materials, movement of excavated materials and site worker trips.

6.7.82 The location of construction compounds are outlined above and shown in Maps CT-05-006B, CT-05-010A.

Table 6-231: Worksite compound details CFA4

Type	Location	(Chainage)	Principal use (TBC)	No of workers	No of staff
Main Site Compound and Facilities	Salusbury Road Shaft	006+000	Salusbury Road Vent Shaft & Salusbury Road ATS (Traction Power System - Preliminary Study - December 2010)	45	15
Main Site Compound and Facilities	Old Oak Common Station	008+600	OOC Station East, OOC Station West, OOC Station Centre, OOC Superstructure, OOC fitout, OCC	300	100
Main Site Compound and Facilities	Old Oak Common GWML	001+400 (GWML)	GWML & Euston Tunnel (Main Line)	50	20

Type	Location	(Chainage)	Principal use (TBC)	No of workers	No of staff
Satellite Compound and Facilities	Old Oak Common Lane	001+400 (GWML)	Old Oak Common Lane Underbridge	50	20
Satellite Compound and Facilities	Central Line Overbridge	001+500 (GWML)	Central Line Overbridge	50	20
Satellite Compound and Facilities	Atlas Road Pre-Casting	009+700	Atlas Road Pre-Casting	75	35
Main Site Compound and Facilities	Willesden Euroterminal Sidings	009+700	Old Oak Common Tunnel	30	10
Main Site Compound and Facilities	Victoria Road Crossover Box	009+800	Victoria Road Crossover Box , Victoria Road footbridge	70	18
Main Site Compound and Facilities	Victoria Road Tunnel Drive	009+700	Victoria Road Tunnel Drive	250	150

6.7.83 An outline of the construction compounds and the timing and duration of busy transport activity at each site is shown in Table 6-232. This represents the periods when the construction traffic flows will be greater than 50% of the peak flows. Also shown is the estimated number of daily vehicle trips during the peak month of activity, the lower end of the range shows the average number of trips in the busy period and the upper end the peak month flows. Activity will be lower than that shown in the table for much of the time. Construction phasing of works will mean that not all the movements will occur at the same time and the timing of peak construction works at each site will in practice not be simultaneous. The assessment scenarios have assumed the peak month for the combination of activities. These are subject to refinement as the design progresses.

Table 6-232: Typical vehicle trip generation for site compounds in this area

Compound type	Location	Access to/from compound	Indicative start / set up date	Estimated duration of use (years)	Estimated duration with busy vehicle movements (years)	Average daily combined two-way vehicle trips during busy period and within peak month of activity	
						Cars/LGV ¹	HGV
Main	Salisbury Road vent shaft	Kilburn Lane/ Salisbury Road / Premier Corner	2018	6.5 years	2 years	5-10	75-100

¹ Light Goods Vehicles (LGV)

Compound type	Location	Access to/from compound	Indicative start / set up date	Estimated duration of use (years)	Estimated duration with busy vehicle movements (years)	Average daily combined two-way vehicle trips during busy period and within peak month of activity	
						Cars/LGV1	HGV
Main	Old Oak Common station	Old Oak Common Lane	2017	9 years	5 years	7-14	105-140
Main	Old Oak Common GWML	Old Oak Common Lane	2021	4 years	2 years	Included in Old Oak Common station trips	Included in Old Oak Common Station trips
Satellite	Old Oak Common Lane underbridge	Old Oak Common Lane	2021	4.5 years	2 years	Included in Old Oak Common station trips	Included in Old Oak Common Station trips
Satellite	Central line overbridge	Old Oak Common Lane	2021	3.5 years	1.5 years	Included in Old Oak Common station trips	Included in Old Oak Common Station trips
Satellite	Atlas Road	Atlas Road	2018	3.5 years	5 years	18-36	270-360
Main	Willesden Euroterminal	Channel Gate Road	2016	7.5 years	2 years	5-10	75-100
Main	Victoria Road crossover box	A4000 Victoria Road, Chase Road and School Road	2017	8 years	2 years	13-26	195-260
Main	Victoria Road tunnel drive	A4000 Victoria Road	2017	4.5 years	3 years	13-26	195-260

6.7.84 It can be seen from the table above that, as with the other shaft sites along the route, these are relatively low construction traffic generators (i.e. no more than 5 HGVs per direction per day, which is typically under 5 HGVs per hour). The main compounds generate substantially higher movements as explained further below, along with construction route vehicle numbers.

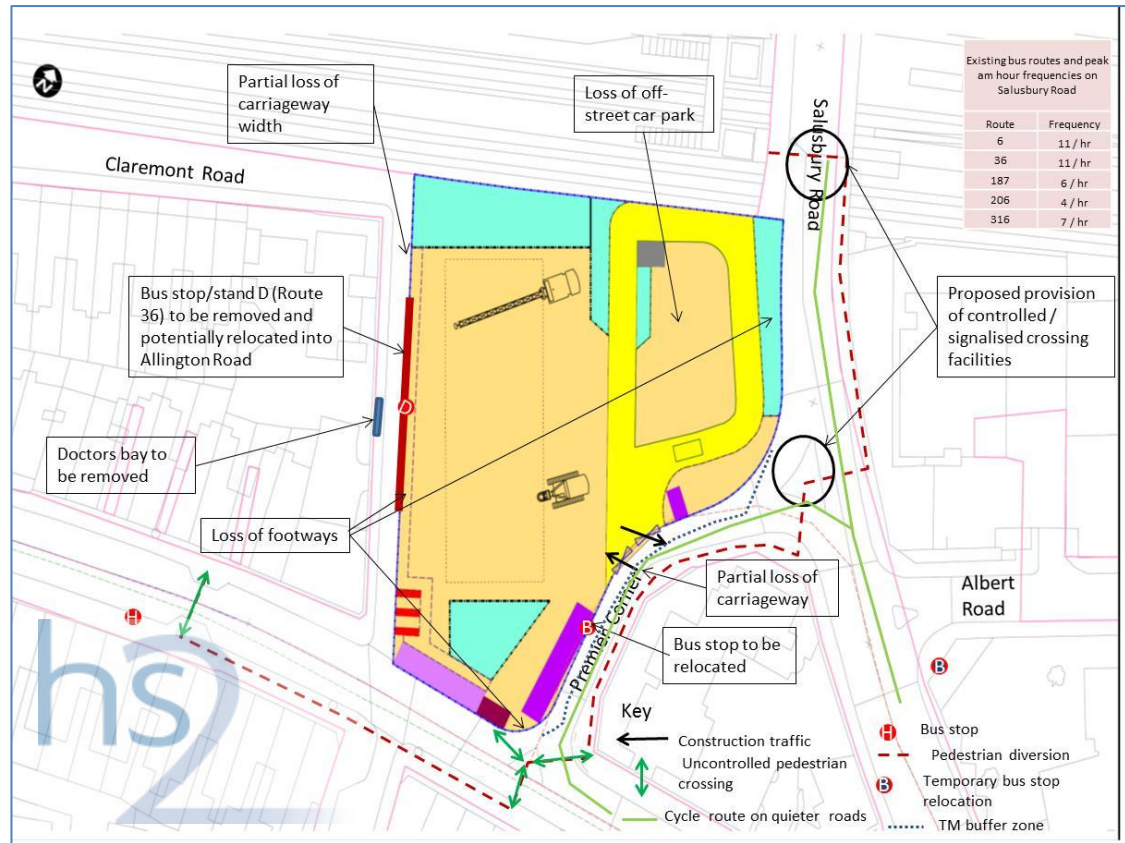
Salisbury Road shaft main compound

6.7.85 The Salisbury Road compound will be used to manage construction of the Salisbury Road vent shaft for civil engineering and railway installation works. The arrangement of the site is shown in Figure 6-188. It will be operational for approximately seven years, comprising approximately two years for peak activity civil engineering works, starting in 2017 and a further four years for civil engineering work. Railway systems installation works will be carried out for approximately 8 months, starting in 2023. There will be approximately 60 workers each day throughout the civil engineering works and approximately 25 workers each day throughout the railway installation works period.

6.7.86 Access into the compound is from Premier Corner.

- 6.7.87 This site requires removal of the car park adjacent to Premier House, and the removal of the bus shelter off Kilburn Lane. Temporary diversions of roads, footpaths and cycleways will be required.
- 6.7.88 Diversions of existing utilities may be required.

Figure 6-188: Salusbury Road shaft & access



Old Oak Common station main compound

- 6.7.89 The overall Old Oak common area construction sites are shown in Figure 6-189 and also these plans also show main access points from the road network.
- 6.7.90 The compound will be used to manage construction of the Old Oak Common HS2 station and the GWML station. This compound will be used for civil engineering and railway installation works between Old Oak Common Lane and Scrubs Lane. The compound will be in place for approximately eight years starting in 2017, supporting approximately 600 workers each day on average adjacent sites across the eight year civil engineering works period and approximately 25 workers each day throughout the railway installations works period.
- 6.7.91 Access into the compound is from Old Oak Common Lane, with HGVs routing northwards to Victoria Road and then to the A40.
- 6.7.92 Temporary closure of Old Oak Common Lane will be required for a period of approximately 12 months. This is following construction of the GWML platforms within Old Oak Common station to allow for lowering and widening the road beneath the GWML rail bridges.
- 6.7.93 Permanent realignment of National Grid power and gas mains, Thames Water sewer and water mains and BT telecommunications will be required for the construction of the new station, together with installation of new station utilities.

Old Oak Common GWML

- 6.7.94 As can be seen from Figure 6-18g, this site will be accessed via the Old Oak Common Lane site.

Old Oak Common Lane underbridge satellite compound

- 6.7.95 The Old Oak Common Lane underbridge satellite compound will be used to manage construction of the Old Oak Common Lane bridge for works between Old Oak Common Lane and Chase Road. The compound will be operational for approximately five years for civil engineering works and be supported approximately 10 workers each day. It will be accessed from Old Oak Common Lane.
- 6.7.96 A temporary road and footpath closure of Old Oak Common Lane will be required for a period of approximately 12 months, to allow demolition and reconstruction of the Old Oak Common Lane bridge.

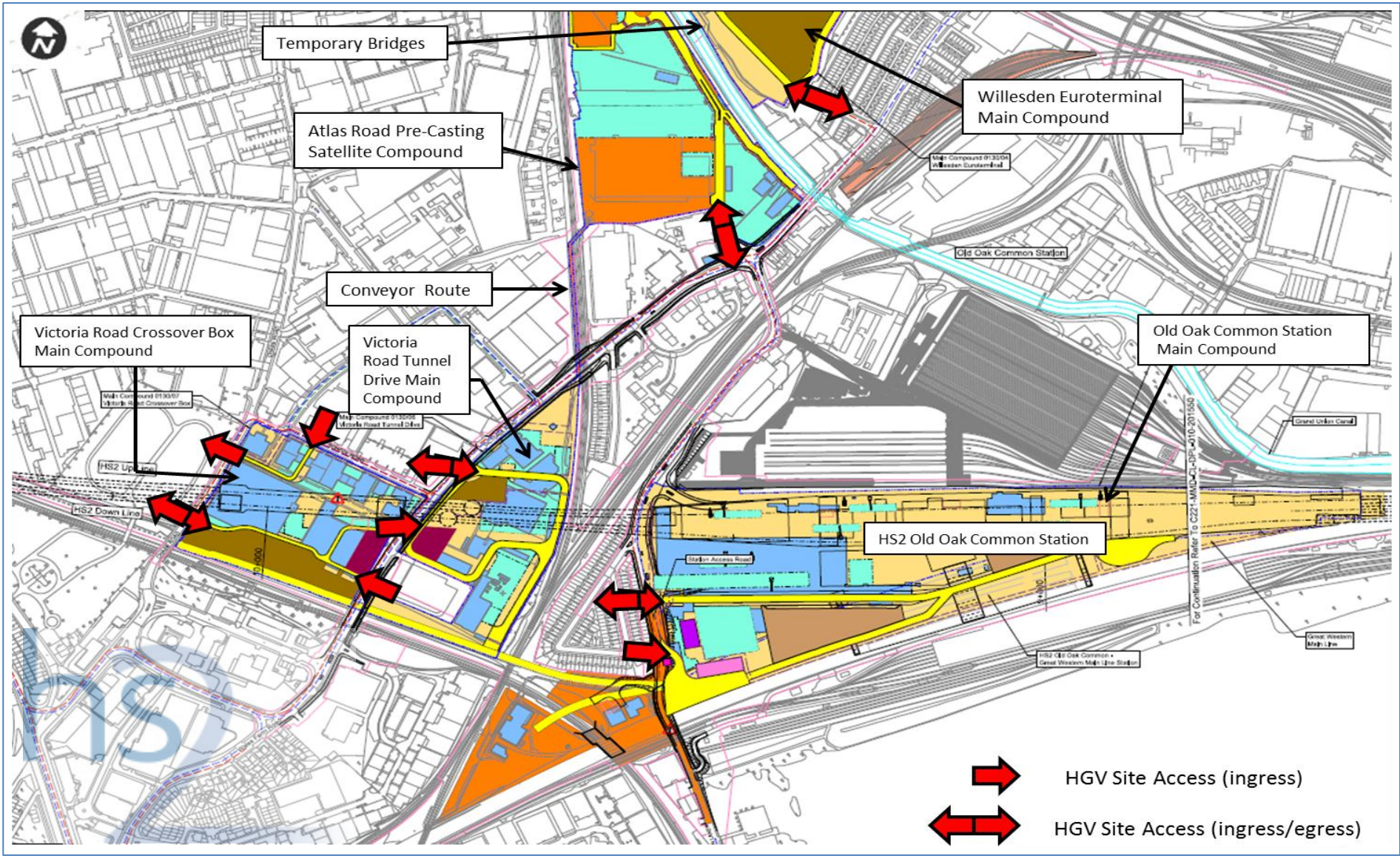
Central Line Bridge satellite compound

- 6.7.97 The Central Line Bridge compound will be used for civil engineering construction works of the London Underground Central Line Bridge. The compound will be operational for approximately three years of civil engineering works, supporting approximately 10 workers each day throughout the civil engineering works period.
- 6.7.98 There will be no diversions of footpaths, cycleways or watercourses.

Atlas Road Pre-Casting satellite compound

- 6.7.99 The Atlas Road compound will be used for production of the pre-cast tunnel linings for the Euston tunnels, HS1-HS2 link tunnel and Northolt tunnel. The compound will be operational for approximately five years, starting in 2017, supposing approximately 21 workers per shift throughout the civil engineering works period.
- 6.7.100 Access into the compound is from Atlas Road. From the A40 Western Avenue HGVs will use A4000 Horn Lane, A4000 Victoria Road and Atlas Road.
- 6.7.101 No permanent diversions of roads will be required. Temporary diversions or traffic management may be necessary for utility diversions for road widening/realignment. No diversions of footpaths, cycleways or watercourses will be required.

Figure 6-18g: Old Oak Common worksite compounds



Willesden Euroterminal main compound

- 6.7.102 The Willesden Euroterminal compound will be used for the temporary storage, loading and removal of excavated material by railway. The material will arise from the excavation of the tunnels throughout the London area. The compound will also be used for supplying material for railway modification works further south along the Proposed Scheme. The compound will be operational for approximately seven years, comprising civil engineering works for approximately four years, starting in 2017 and existing railway installation works for approximately 12 months, starting in 2017 and then a further 12 months starting in 2023. The compounds will support approximately 30 workers each day throughout the civil engineering works period and support approximately 50 workers each day throughout the existing railway modification works peak periods. It will be used for existing railway modification work required to take place at night, weekends or during bank holidays.
- 6.7.103 Access into the compound is from Channel Gate Lane. No diversions of footpaths, cycleways or watercourses will be required.

Victoria Road crossover box main compound

- 6.7.104 The Victoria Road crossover box main compound will be used to manage construction of the Victoria Road crossover box. In addition it will be used to launch and operation of the tunnelling machines for the Northolt tunnel which will take approximately four years. The compound will be operational for approximately five years, comprising civil engineering works for approximately four years, starting in 2017 and railway installation works for approximately 12 months, starting in 2023. It will support approximately 70 workers each day throughout the civil engineering works period and approximately 50 workers each day throughout the railway installations works period. Diversions of utilities will be required at this site.
- 6.7.105 There are three site access points at this compound. Access into the compound is from A4000 Victoria Road, Chase Road and School Road.
- 6.7.106 Temporary closure of Bethune Road will be required for a period of approximately four years. Westbound traffic will be diverted via School Road and St. Leonard's Road, eastbound traffic diverted via St. Leonard's Road and Chandos Street.
- 6.7.107 No diversions of footpaths or cycleways will be required. No diversions of watercourses will be required.

Victoria Road tunnel drive main compound

- 6.7.108 The Victoria Road tunnel compound will be used for civil engineering and tunnelling installation works between Old Oak Common Lane and Victoria Road and logistical support for construction of the Euston tunnels and Northolt tunnel. The compound will be operational for approximately five years, comprising civil engineering works starting in 2017 and support approximately 250 workers each day throughout the civil engineering works period.
- 6.7.109 Access into the compound is from A4000 Victoria Road. Diversions of existing utilities and the installation of new utilities in or near Victoria Road will be required.
- 6.7.110 No permanent diversions of roads will be required.

- 6.7.111 Temporary diversions and lane restrictions will be required during utility diversions and road widening operations along Victoria Road.
- 6.7.112 When the two subways are constructed (to widen Victoria Road) under the NR embankment, the footpaths and cycle ways will then be permanently realigned.
- 6.7.113 No diversions of watercourses will be required.
- 6.7.114 The Willesden EuroTerminal construction compound, Victoria Road tunnel drive construction compound, Atlas Road pre-casting main construction compound and Victoria Road crossover box compound will be linked via a conveyor.

Construction lorry routes

- 6.7.115 Lorry routes are shown in TR-03-004b, TR-03-005, TR-03-006 (Volume 5, Mapbook 71) and in Figure 6-18g.
- 6.7.116 It is envisaged that the A40 Western Avenue and M25 motorway will provide the primary HGV access and egress routes. The final approaches to the worksites in this CFA are shown in the following diagrams and described in the text.
- 6.7.117 Where reasonably practicable, site access to the Salusbury Road compound for construction traffic will adopt a left in – left out circulation principle to minimise disruption to traffic by avoiding right turns across existing traffic.
- 6.7.118 Construction vehicles will be able to access the Salusbury Road vent shaft compound from either the west or east, via Premier Corner.
- 6.7.119 From the west HGVs would exit the A40 Westway at the A219 Wood Lane before turning right into North Pole Road and continuing along Barlby Road. It would then turn left onto the B450 Ladbroke Road and continue until it reaches the junction with the B413 Banister Road turning right where adjoins B413 Kilburn Lane. It would then continue along B413 Kilburn Lane until and site is reached by turning left into Premier Corner and into the site.
- 6.7.120 HGVs routed from the east would approach the site would exit the A501 from the Marylebone Flyover and turn into the A5 Edgware Road and continuing along A5 Maida Vale. It would then turn right into the B413 Carlton Vale which connects with Premier Corner and the site access.
- 6.7.121 HGV routes for The Old Oak Common Construction compound will adopt the approved HGV route for Crossrail Depot works via the A40 Western Avenue, A400 Horn Lane, Victoria Road, Wales Farm Road, A4000 Victoria Road and Old Oak Common Lane.
- 6.7.122 Access to the Willesden Euroterminal compound will be from Channel Park Lane. From the A40 Western Avenue HGVs will use A4000 Horn Lane, A4000 Victoria Road, Old Oak Lane and Channel Gate Lane.
- 6.7.123 Access to the Victoria Road crossover box will be from the A40 Western Avenue construction vehicles including HGVs will use A4000 Horn Lane, A4000 Victoria Road then one of the following:-
- Wales Farm Road and A4000 Victoria Road;
 - Victoria Road and Chase Road;

- Victoria Road and School Road;

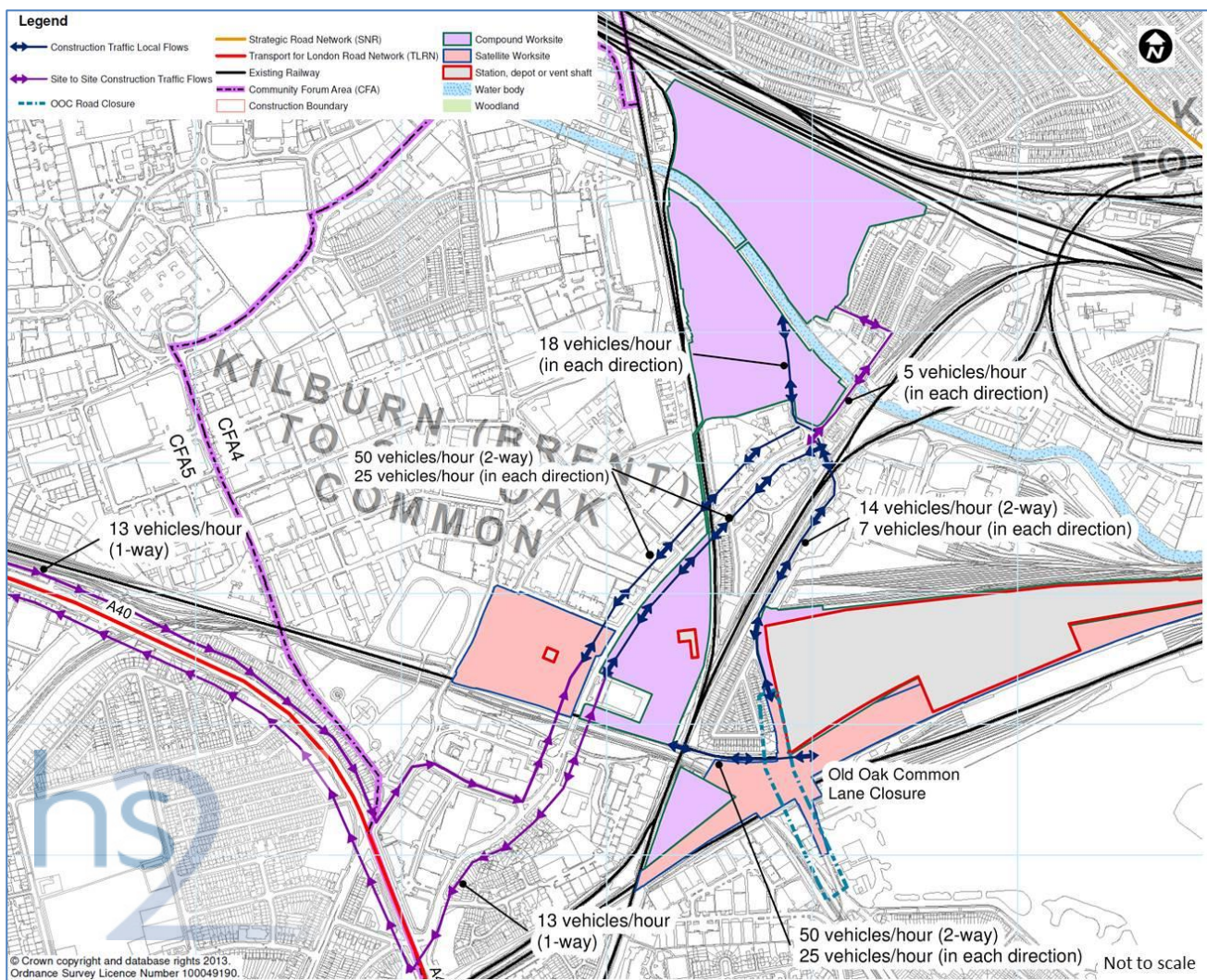
6.7.124 Access to the Victoria Road compound will be via A40 Western Avenue, A400 Horn Lane, Victoria Road, Wales Farm Road and the A4000 Victoria Road.

Construction vehicle movements

6.7.125 Figure 6-190 shows peak HGV movements per hour anticipated in the peak months. These movements represent the realistic most severe loading that is expected to occur prior to the Willesden Railhead and conveyor becoming fully operational (in Q4 2017 to Q1 2018). In the WELHAM assessments the same level of HGV movements have been assumed when Old Oak Common Lane is closed, although in practice the operation of the Willesden Railhead will substantially reduce construction HGV movements.

6.7.126 The assessment also includes for in-combination effects by taking into account construction traffic routing along roads which pass through the CFA to access construction compounds in neighbouring areas.

Figure 6-190: CFA4 HGV route loadings



6.7.127 Construction workforce numbers have been estimated for each compound as described in the previous section.

Traffic management, road closures and diversions

- 6.7.128 There will be traffic diversions as set out below. As a result of the man works there will a number of track possessions. For the Old Oak Common works these are mainly expected to comprise a number of 24 hour weekend possessions within the period Q1 2018 to Q4 2022. The diversion strategy explained below may be implemented during track possessions periods.

Salisbury Road

- 6.7.129 No general traffic or bus diversions are anticipated to be associated with the Salusbury Road vent shaft compound.
- 6.7.130 As shown previously in Figure 6-188, the footprint of the proposed compound shows that the northern footway of B413 Kilburn Lane between Claremont Road and Premier Corner, the western footway of Premier Corner and the western footway on Salusbury Road from Premier Corner up to Queen's Park Underground station is encompassed into the worksite. This will result in the temporary loss of the pedestrian route on the west side footway between Kilburn Lane and Salusbury Road.
- 6.7.131 The pedestrian diversion is as follows: from Kilburn Lane pedestrians will be required to cross on to the southern footway and continue eastbound and cross Kilburn Road on to the eastern footway of Premier Corner via the zebra crossing and continue northbound crossing Salusbury Road on its eastern footway. From here pedestrians would walk northbound and cross Salusbury Road on to the western footway for Queen's Park station.

Old Oak Common

- 6.7.132 The closure of Old Oak Common Lane will require both general traffic and bus diversions.
- 6.7.133 It would be necessary to confine vehicles to the strategic road network and local distributor roads as far as practicable to reduce noise and air quality effects on local residential areas. Therefore, the suggested southbound diversion route for the Old Oak Common Lane closure would be via Victoria Road, Wales Farm Road and Western Avenue (eastbound); a total distance of around 2.5km. The northbound diversion would be via the Western Avenue (westbound), Leamington Park, Horn Lane and Victoria Road; a total distance of around 2.9km.
- 6.7.134 Without mitigation, a road closure on Old Oak Common Lane would require the introduction of a diversion route for local bus service 228 between Maida Hill and Central Middlesex Hospital. Alternative route choices in this area are limited. A potential southbound diversion route could be via Victoria Road, Wales Farm Road, Western Avenue/ St. Andrews Road / The Fairway (westbound) / Carlisle Avenue (northbound) / Long Drive (eastbound), a total distance of around 3.3km. This diversion would omit two southbound bus stops on Old Oak Common Lane.
- 6.7.135 The northbound diversion would be slightly more circuitous at around 4.4km in length, via Long Drive, Carlisle Avenue, The Fairway (eastbound), Old Oak Common Lane (southbound) Old Oak Road, East Acton Lane, Old Oak Common Lane (northbound), Western Avenue (westbound), Leamington Park, Horn Lane, Victoria Road, Wales Farm Road, Victoria Road. Again, two stops on Old Oak Common Lane would be omitted.
- 6.7.136 As detailed scheme design progresses, diversions will be further progressed with L.B. Ealing, L.B. of Hammersmith and Fulham and TfL Buses.

- 6.7.137 A local long-term pedestrian diversion may be implemented when the 160m section of footway on the eastern side of Old Oak Common Lane is closed to pedestrians for the duration of the works. The diversion will require pedestrians to cross to the western side of Old Oak Common Lane. The exact specification of any crossings is to be determined and will be subject to a detailed assessment of forward visibility as part of a road safety audit prior to implementation. In practice bus schedules would be reviewed, as is normal practice with major construction projects.
- 6.7.138 Construction planning will aim to restrict full closures of Old Oak Common Lane to a minimum. If full closures are required however, where possible these will be restricted to weekends and local mitigation to maintain pedestrian access will be investigated.
- 6.7.139 In the event of a full closure of Old Oak Common Lane (i.e. for overbridge reconstruction) and in the absence of any local mitigation to maintain pedestrian movement past the closure, a diversion would be required as described. To reach the other side of any closure, pedestrians would be required to walk along Victoria Road, Wales Farm Road, the A40 Westway and Long Drive. The total distance is up to approximately 3.5km.

Figure 6-191: Old Oak Common area diversions when Old Oak Common Lane closed

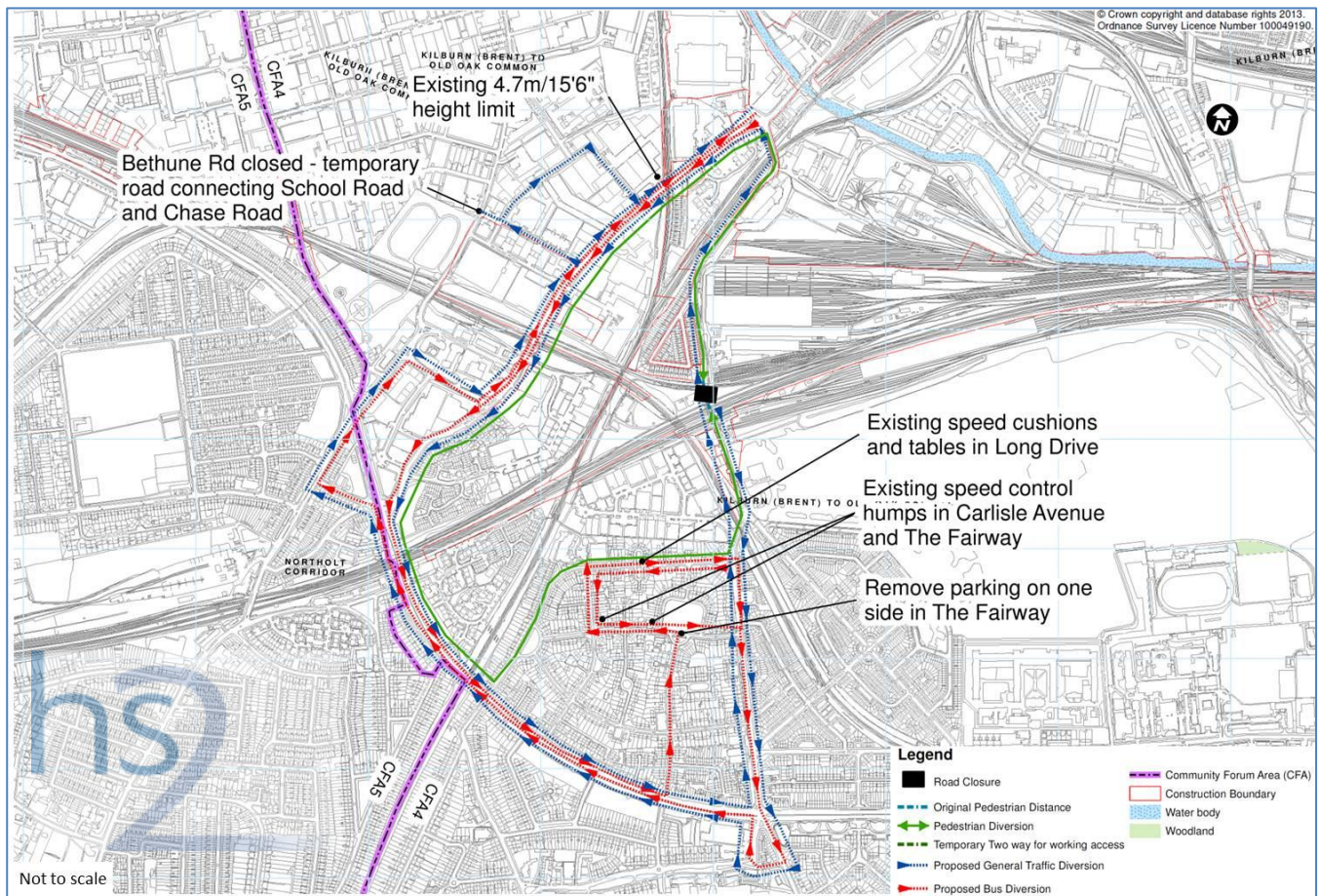


Table 6-233: Road closures and diversions around the Old Oak Common Lane closure

Name	Location	Diversion route (two-way except where described)	Approximate length of diversions	Programme	Duration
Old Oak Common Lane general traffic	Southbound from north side	Old Oak Common Lane northbound, Victoria Road, Wales	2.5km southbound,	Q1 2021 - Q2 2025	1 year

Name	Location	Diversion route (two-way except where described)	Approximate length of diversions	Programme	Duration
	of GWML bridge to south side of bridge	Farm Road (northbound route via Leamington Park and Horn Lane), A40 Western Avenue, Old Oak Common Lane northbound (northbound route via Old Oak Road, East Acton Lane and Old Oak Common Lane northbound to A40).	2.9km northbound		
Old Oak Common Lane buses southbound	From Victoria Road to Long Drive	Victoria Road, Wales Farm Road, A40 Western Avenue then southbound buses northbound on St Andrews Road, The Fairway, Carlisle Avenue, Long Drive.	3.3km southbound	Q1 2021 - Q2 2025	1 year
Old Oak Common Lane buses northbound	From Long Drive to Victoria Road	Long Drive, Carlisle Avenue, The Fairway, Old Oak Common Lane, Old Oak Road, East Acton Lane, A4 Western Avenue, Leamington Park, Horn Lane, Victoria Road	4.4km northbound	Q1 2021 - Q2 2025	1 year
Old Oak Common Lane pedestrians	Described southbound from north side of bridge to south side of bridge	Old Oak Common Lane northbound, Victoria Road, A40 Western Avenue, The Approach, The Crescent, Long Drive Old Oak Common Lane	3.5km	Q1 2021 - Q2 2025	1 year

Avoidance and mitigation measures

- 6.7.140 The engineering and construction design has been conceived in order to minimise the impacts during construction. All construction activity will be undertaken in accordance with the draft CoCP which seeks to minimise adverse impacts. The measures in the draft CoCP include clear controls on vehicle types, hours of site operation, and routes for heavy goods vehicles, to reduce the impact of road based construction traffic. In order to achieve this, generic and site specific traffic management measures will be implemented during the construction of the project on or adjacent to public roads, bridleways, footpaths and other PRoW affected by the Proposed Scheme as necessary.
- 6.7.141 Where reasonably practicable, the number of private car trips to and from the site (both workforce and visitors) will be reduced by encouraging alternative modes of transport or vehicle sharing. A framework construction workers travel plan will be produced by each principal contractor which will aim to encourage the use of sustainable modes of transport and reduce the impact of workforce traffic on the highway network. The reductions in impacts arising from the travel plan measures have not been included in the assessment as presented in this report.
- 6.7.142 Rail replacement services will be provided as necessary when rail possessions are in place.
- 6.7.143 No further traffic and transport mitigation measures during construction of the Proposed Scheme are considered necessary, based on the outcomes of this assessment.

Kilburn (Brent) to Old Oak Common (CFA4) construction impacts

Key construction transport issues

- 6.7.144 The temporary traffic and transport impacts within this CFA are due to construction vehicle movements to/from the vent shaft construction compounds at Salusbury Road, which equates to under 100 vehicle movements per day (50 in and 50 out), and the substantial movements associated with the major engineering works in the Old Oak Common areas.
- 6.7.145 Construction vehicle movements required to construct the Proposed Scheme include the delivery of plant and materials, movement of excavated materials and construction compound worker trips.
- 6.7.146 Construction of HS2 in this area will have temporary effects which will include increased traffic demand associated with material movement and workers on a number of roads through the area, and also the impact of diversions required to construct the works. The following sections consider in the impacts in more detail.

Trip generation and assignment of trips

- 6.7.147 Trip generation is set out above. Construction trips have been assigned to the road network according to the routes set out in the drawings above and in series CT-05-010 to ~015.

Strategic and local road network traffic flows

- 6.7.148 The highway assignment uses the above construction flows added to the overall background flows in WELHAM.
- 6.7.149 The flows are shown for the wider area along the line of the HS2 corridor covering CFA4 to CFA6 as a means of identifying both strategic and more localised impacts. For assessment purposes Heavy Vehicles include both normal HGVs and buses. However it is noted that within the CFA4-6 HS2 corridor bus flows are relatively low compared to central London, and flow differences are thus small.
- 6.7.150 It should be noted that the traffic flow plots are presented as model output in passenger car units (pcus) whilst the link flow tabulations below are in vehicles. Therefore for a typical 5% HGVs (with pcu value 2) in the peak hour 100 pcus represents 95 vehicles. 100 pcu is illustrated as 1mm at A4 size.
- 6.7.151 The junction assessments which follow the link flow assessments are presented in pcus.
- 6.7.152 The following tables (Table 6-234 and Table 6-235) set out flows on key roads, comparing 2021 baseline flows with 2021 construction case flows along the Proposed Scheme construction. In both cases the construction HGV route loadings shown in Figure 6-190 have been included. For comparative purposes the flows in CFA5 and CFA6 are also included.
- 6.7.153 As explained in the regional section, the scenarios considered are:
- WELHAM Construction Test 1 refers to late 2017-early 2018 with peak construction HGV movements leading up to the start of operation of the Willesden Railhead for HS2 construction movements
 - WELHAM construction Test 2 refers to the planned closure of Old Oak Common

Lane for construction purposes within CFA4 over periods in 2023-2024.

6.7.154 The screenline analysis shows that the traffic impacts on general traffic flows are largely confined to the areas around the main construction interventions at Old Oak Common/ Victoria Road (CFA4) and at West Ruislip/Harvil Road (CFA6)

Table 6-234: WeLHAM AM peak hour model screenline analysis for construction tests

Location	Direction	Future baseline 2021		2021 construction Test 1		Test 1 change from 2021 future baseline				2021 construction Test 2		Test 2 change from 2021 future baseline			
		All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles %	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles
CFA4															
Kilburn High Road (south of Belsize Road)	NB	639	82	645	82	5	0	1%	1%	646	82	6	1	1%	1%
	SB	203	48	204	47	1	-1	0%	-1%	204	47	0	-1	0%	-1%
Salusbury Road (north of Premier Corner)	NB	511	10	506	10	-6	0	-1%	0%	505	10	-6	0	-1%	-2%
	SB	479	11	480	11	1	0	0%	1%	493	11	14	0	3%	0%
Premier Corner (north of Kilburn Lane)	NB	975	58	973	58	-1	0	0%	0%	974	58	-1	0	0%	0%
Chamberlayne Road (north of Kilburn Lane)	NB	351	60	351	60	1	0	0%	0%	356	60	6	1	2%	1%
	SB	479	78	473	78	-5	0	-1%	0%	481	79	3	1	1%	1%
Harrow Road (west of College Road)	WB	406	25	407	25	0	0	0%	0%	409	26	2	1	1%	6%
	EB	356	45	357	45	0	0	0%	0%	382	46	25	1	7%	2%
Scrubs Lane (north of Hythe Road)	NB	381	33	381	33	1	0	0%	0%	444	34	64	1	17%	3%
	SB	735	62	736	62	0	0	0%	0%	857	60	122	-1	17%	-2%
Old Oak Common Lane (north of Wulfstan Street)	NB	243	27	241	27	-2	0	-1%	0%	13	13	-230	-14	-95%	-51%
	SB	413	29	408	29	-5	0	-1%	1%	13	13	-400	-16	-97%	-55%
Old Oak Common Lane (south of Du Cane Road)	NB	628	36	632	36	4	0	1%	0%	611	29	-17	-7	-3%	-19%
	SB	343	32	343	32	0	0	0%	1%	292	26	-50	-6	-15%	-19%
Wales Farm Road	SB	1072	144	1083	158	12	15	1%	10%	1197	167	126	23	12%	16%
Victoria Road (north of Park Royal Road)	NB	990	118	997	133	7	15	1%	13%	1036	139	46	21	5%	18%
Park Royal Road	NB	433	35	435	36	2	0	0%	1%	443	37	10	1	2%	4%
	SB	336	62	335	62	-2	0	-1%	0%	332	63	-4	1	-1%	1%

Location	Direction	Future baseline		2021 construction		Test 1 change from 2021				2021 construction		Test 2 change from 2021			
		2021		Test 1		future baseline				Test 2		future baseline			
		All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles %	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles
CFA5															
Coronation Road	EB	228	14	227	14	-1	0	0%	0%	228	14	0	0	0%	0%
	WB	33	10	33	10	0	0	0%	0%	33	10	0	0	0%	0%
Connell Crescent bridge	EB	345	8	344	8	-1	0	0%	0%	344	8	-1	0	0%	0%
	WB	15	0	15	0	0	0	-1%	0%	15	0	0	0	-2%	0%
Hanger Lane East Bridge	SB	5034	304	5033	303	-2	0	0%	0%	5041	306	7	2	0%	1%
Hanger Lane West Bridge	NB	4516	236	4511	236	-6	0	0%	0%	4523	236	6	0	0%	0%
Alperton Lane	NB	548	1	543	1	-5	0	-1%	2%	550	1	3	0	0%	10%
	SB	368	38	369	38	0	0	0%	0%	367	38	-1	0	0%	-1%
Bideford Avenue	NB	309	10	309	10	0	0	0%	0%	309	10	0	0	0%	0%
	SB	432	27	430	27	-1	0	0%	0%	431	27	-1	0	0%	0%
Horsenden Lane	NB	245	8	244	8	-1	0	0%	0%	245	8	0	0	0%	0%
	SB	255	23	254	23	-1	0	0%	0%	254	23	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	420	16	422	16	2	0	1%	0%	420	15	0	0	0%	-1%
	SB	541	8	541	8	1	0	0%	1%	542	8	1	0	0%	2%
Greenford Road (south of Uneeda Drive)	NB	821	86	822	86	1	0	0%	0%	823	86	2	0	0%	0%
	SB	851	65	852	65	1	0	0%	0%	852	65	1	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	316	19	321	19	5	0	2%	0%	322	19	6	0	2%	1%
	SB	633	23	632	23	-1	0	0%	-1%	632	23	-1	0	0%	-1%
Mandeville Road (north of Eastcote Lane)	NB	1245	42	1245	42	-1	0	0%	0%	1242	42	-4	0	0%	0%
	SB	832	35	833	35	1	0	0%	0%	833	35	1	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1137	60	1144	60	7	0	1%	0%	1144	60	7	0	1%	0%
	SB	1005	51	1002	51	-3	0	0%	0%	1002	51	-3	0	0%	0%
Eastcote Lane	EB	651	13	653	13	2	0	0%	0%	652	13	1	0	0%	1%
	WB	322	12	333	12	11	0	3%	1%	335	12	13	0	4%	1%

Location	Direction	Future baseline 2021		2021 construction Test 1		Test 1 change from 2021 future baseline				2021 construction Test 2		Test 2 change from 2021 future baseline			
		All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles %	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles
CFA6															
West End Road	NB	685	43	689	32	4	-11	1%	-25%	688	31	3	-12	1%	-27%
	SB	528	28	502	27	-26	-1	-5%	-2%	499	27	-29	-1	-6%	-2%
Ickenham Road	NB	748	25	731	42	-17	16	-2%	65%	730	42	-18	16	-2%	65%
	SB	1122	72	1158	78	36	6	3%	8%	1158	77	37	5	3%	7%
Breakspear Road	NB	561	14	539	25	-22	11	-4%	81%	539	25	-22	11	-4%	81%
	SB	669	18	672	30	3	12	0%	65%	671	30	2	12	0%	65%
Harvil Road	NB	335	22	371	98	36	76	11%	345%	372	98	36	76	11%	345%
	SB	471	16	451	93	-19	76	-4%	463%	451	93	-20	76	-4%	463 %
Swakeleys Road (south)	NB	1642	89	1609	192	-32	104	-2%	117%	1609	192	-32	103	-2%	117%
	SB	1574	123	1555	216	-19	92	-1%	75%	1555	216	-19	92	-1%	75%

- 6.7.155 The screenline analysis for the AM peak hour shows that the traffic impacts on general traffic flows are largely confined to the areas immediately around the main construction interventions at Old Oak Common / Victoria Road (CFA4) and at West Ruislip/Harvil Road (CFA6), with minimal changes on links in the central section (CFA5).
- 6.7.156 As would be expected, the highest impact in CFA4 is on Victoria Road and Wales Farm Road at up to 13% increase in HGV traffic under construction scenario 1, and increasing to 18% in construction scenario 2, with a 15% increase in general traffic.
- 6.7.157 The highest percentage change in CFA5 is on Eastcote Lane westbound (4% or 12 vehicles per hour in construction test 2). Within CFA6 the greatest impact is on Harvil Road northbound general traffic levels rise by 11% but HGV levels increase by 345% in both construction scenarios.

Table 6-235: WeLHAM PM peak hour model screenline analysis for construction tests

Location	Direction	Future baseline 2021		2021 construction Test 1		Test 1 change from 2021 future baseline				2021 construction Test 2		Test 2 change from 2021 future baseline			
		All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles %	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles
CFA4															
Kilburn High Road (south of Belsize Road)	NB	543	53	542	54	-1	0	0%	1%	550	54	7	1	1%	1%
	SB	327	46	325	46	-1	0	0%	0%	329	46	2	0	1%	0%
Salisbury Road (north of Premier Corner)	NB	562	7	564	7	2	0	0%	0%	564	7	1	0	0%	0%
	SB	370	10	368	10	-2	0	-1%	1%	375	10	4	0	1%	0%
Premier Corner (north of Kilburn Lane)	NB	977	38	980	38	3	0	0%	0%	974	38	-3	0	0%	0%
Chamberlayne Road (north of Kilburn Lane)	NB	639	66	637	66	-2	0	0%	0%	638	65	-1	-1	0%	-1%
	SB	486	51	486	51	0	0	0%	0%	492	51	6	0	1%	0%
Harrow Road (west of College Road)	WB	541	27	543	27	2	0	0%	1%	569	27	28	0	5%	1%
	EB	409	22	410	22	1	0	0%	0%	420	22	12	0	3%	1%
Scrubs Lane (north of Hythe Road)	NB	897	40	898	40	1	0	0%	0%	1052	46	155	6	17%	16%
	SB	465	24	465	24	-1	0	0%	0%	531	25	66	1	14%	2%
Old Oak Common Lane (north of Wulfstan Street)	NB	398	29	388	29	-10	0	-2%	0%	13	13	-385	-16	-97%	-55%
	SB	231	16	229	16	-2	0	-1%	0%	13	13	-218	-3	-94%	-17%
Old Oak Common Lane (south of Du Cane Road)	NB	336	26	336	26	0	0	0%	0%	330	21	-7	-5	-2%	-19%
	SB	437	25	439	25	1	0	0%	0%	473	31	36	6	8%	22%
Wales Farm Road	SB	1175	55	1181	70	6	15	0%	27%	1161	64	-14	10	-1%	18%
Victoria Road (north of Park Royal Road)	NB	826	45	841	60	15	15	2%	32%	873	63	47	17	6%	37%
Park Royal Road	NB	358	41	359	41	1	0	0%	0%	383	41	25	0	7%	-1%
	SB	399	24	399	24	1	0	0%	0%	403	23	4	0	1%	-1%
CFA5															
Coronation Road	EB	123	12	122	12	0	0	0%	0%	126	13	3	0	2%	3%
	WB	62	10	62	10	0	0	0%	0%	59	10	-3	0	-4%	0%
Connell Crescent bridge	EB	135	5	135	5	0	0	0%	1%	139	6	3	1	2%	19%
	WB	45	0	45	0	0	0	0%	0%	45	0	0	0	0%	0%
Hanger Lane East Bridge	SB	4648	145	4635	145	-13	0	0%	0%	4687	146	39	1	1%	1%

Location	Direction	Future baseline 2021		2021 construction Test 1		Test 1 change from 2021 future baseline				2021 construction Test 2		Test 2 change from 2021 future baseline			
		All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles %	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles
Hanger Lane West Bridge	NB	4667	146	4642	146	-25	0	-1%	0%	4675	148	8	2	0%	1%
Alperton Lane	NB	369	0	374	0	5	0	1%	1%	375	0	5	0	1%	0%
	SB	286	2	285	2	0	0	0%	-1%	287	2	1	0	0%	2%
Bideford Avenue	NB	232	7	231	7	-1	0	0%	-1%	233	7	1	0	1%	0%
	SB	687	24	687	24	0	0	0%	0%	688	24	1	0	0%	0%
Horsenden Lane	NB	302	13	305	13	3	0	1%	-1%	306	12	3	-1	1%	-6%
	SB	298	8	298	8	0	0	0%	-1%	296	8	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	481	3	481	2	0	0	0%	-8%	486	3	4	0	1%	0%
	SB	495	2	502	2	7	0	1%	0%	497	2	2	0	0%	4%
Greenford Road (south of Uneeda Drive)	NB	995	38	998	38	3	0	0%	0%	1000	39	5	0	1%	0%
	SB	947	40	952	40	5	0	1%	0%	949	40	1	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	592	17	596	17	4	0	1%	1%	594	17	3	0	0%	0%
	SB	480	13	480	13	0	0	0%	0%	481	13	1	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1239	26	1239	26	0	0	0%	0%	1232	26	-7	0	-1%	0%
	SB	826	22	829	22	4	0	0%	0%	830	21	4	0	0%	-1%
Mandeville Road (south of Eastcote Lane)	NB	1519	31	1519	31	-1	0	0%	1%	1516	31	-3	0	0%	0%
	SB	502	33	505	33	3	0	1%	0%	502	33	0	0	0%	0%
Eastcote Lane	EB	634	8	635	8	1	0	0%	0%	632	8	-2	0	0%	0%
	WB	459	10	463	10	4	0	1%	0%	467	10	8	0	2%	0%
CFA6															
West End Road	NB	872	10	880	11	8	0	1%	1%	873	11	2	0	0%	0%
	SB	620	10	623	11	3	0	0%	1%	621	11	1	0	0%	1%
Ickenham Road	NB	1087	23	1168	35	81	12	7%	53%	1169	34	83	11	8%	48%
	SB	944	21	910	38	-34	17	-4%	79%	909	38	-35	17	-4%	79%
Breakspear Road	NB	754	8	687	24	-67	16	-9%	206%	687	26	-67	18	-9%	222%
	SB	490	10	505	21	15	11	3%	118%	506	21	16	11	3%	118%

Location	Direction	Future baseline 2021		2021 construction Test 1		Test 1 change from 2021 future baseline				2021 construction Test 2		Test 2 change from 2021 future baseline			
		All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles %	All vehicles	Heavy vehicles	All vehicles	Heavy vehicles	All vehicles %	Heavy vehicles
Harvil Road	NB	387	16	426	94	39	78	10%	484%	427	94	40	78	10%	484%
	SB	428	9	506	87	78	78	18%	898%	509	87	82	78	19%	898%
Swakeleys Road (south)	NB	1455	137	1404	240	-51	103	-4%	75%	1403	240	-52	103	-4%	75%
	SB	1337	79	1361	186	25	107	2%	136%	1363	186	27	107	2%	136%

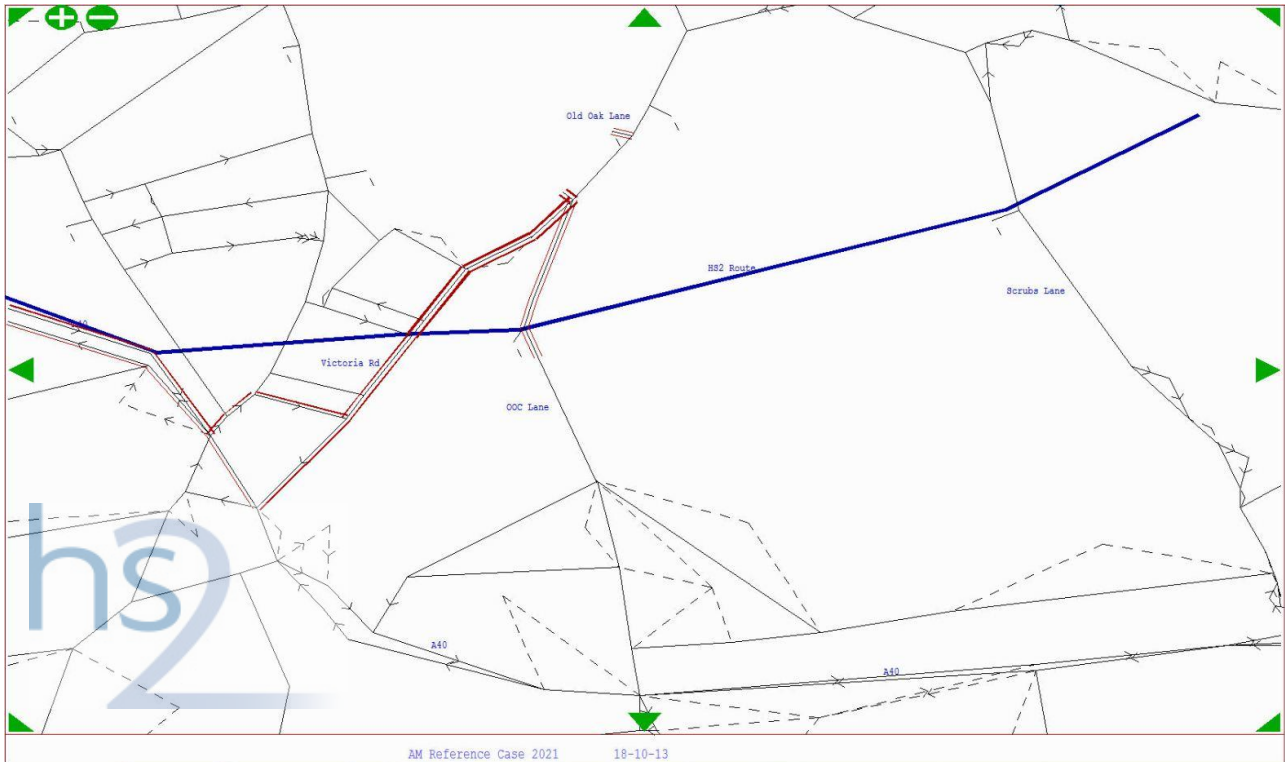
6.7.158 The PM peak hour leads to very similar conclusions as for the AM peak hour. It can be concluded that the impact of construction interventions is largely confined to the areas around the sites and on construction routes to the A40. Closer analysis has been undertaken on key junctions around the sites and on approaches to identify the impacts of HGV construction traffic flows and more localised junction impacts.

6.7.159 In undertaking local junction assessments it should be noted that for shaft sites, which typically generate under 50 HGV movements per direction per day (i.e. under 1 HGV every 10 minutes), this will not impact on junction operation. However, higher levels of HGV movements or diversionary effects from construction traffic management will potentially impact on link flows and on junction operation.

Link flow summary plots 2021 construction tests CW1 & CW2

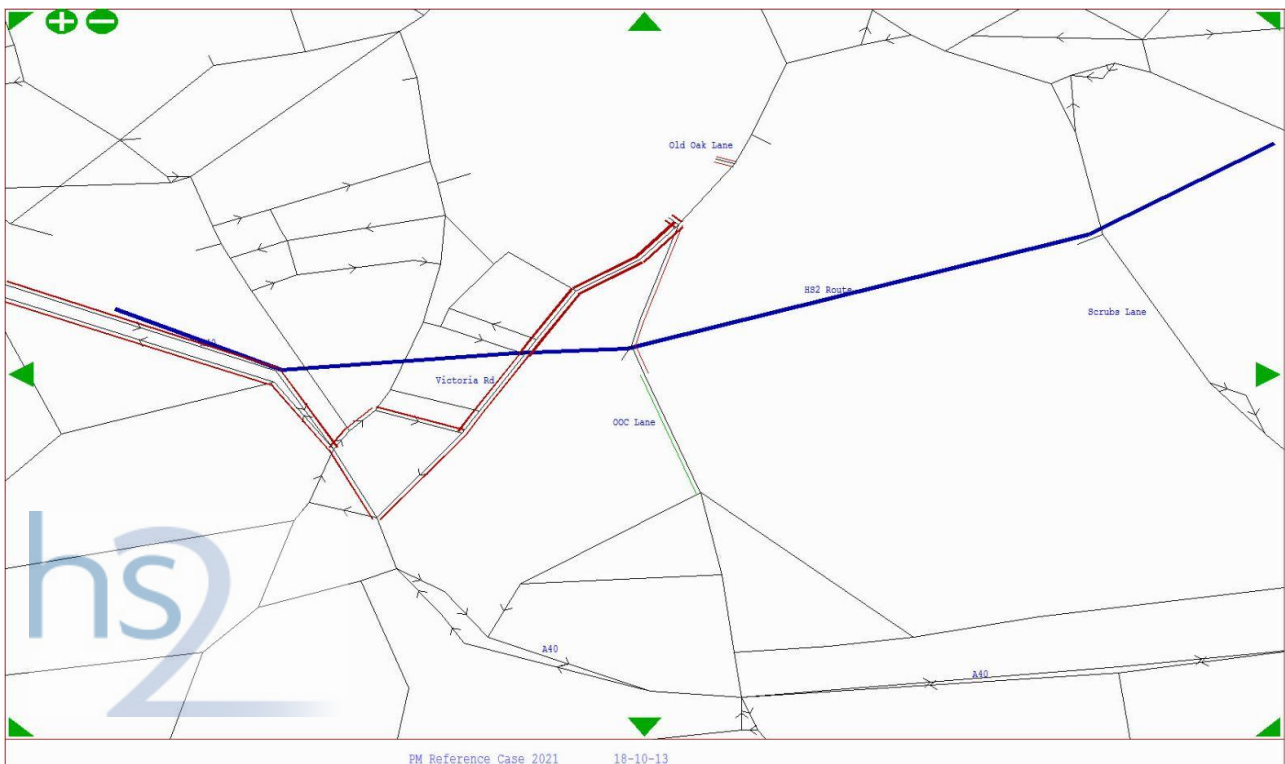
6.7.160 The results of the highway assignment for the 2021 construction tests 1 and 2 for AM and PM periods are illustrated in Figure 6-192 to Figure 6-195.

Figure 6-192: Difference in Demand Flows: 2021 construction test 1 versus 2021 Baseline AM period (at A4 size 1 mm=100pcu)



6.7.161 This diagram mainly covers the CFA4 area, with CFA5 links to the south and east of the A40 Westway. In the AM period for construction test 1 there is no impact on roads in CFA5.

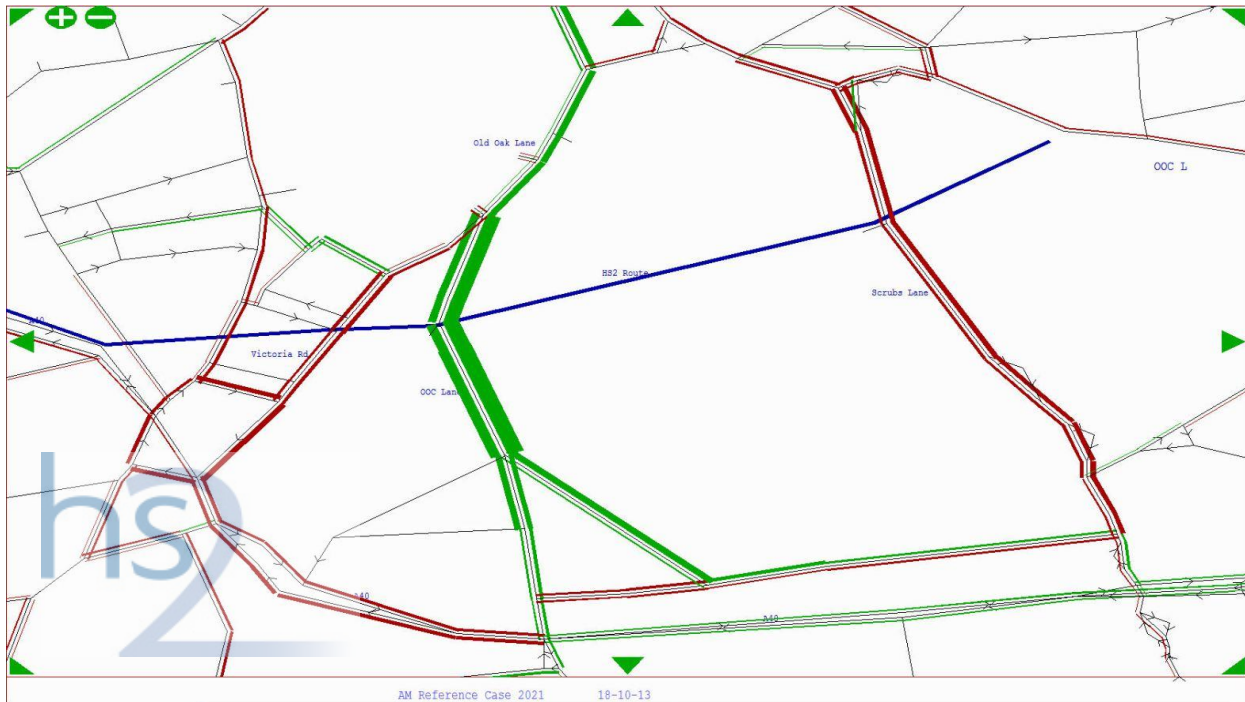
Figure 6-193: Difference in Demand Flows: 2021 with Hs2 construction test 1 versus 2021 Baseline PM period.



6.7.162 In the PM period this shows a similar pattern to the AM.

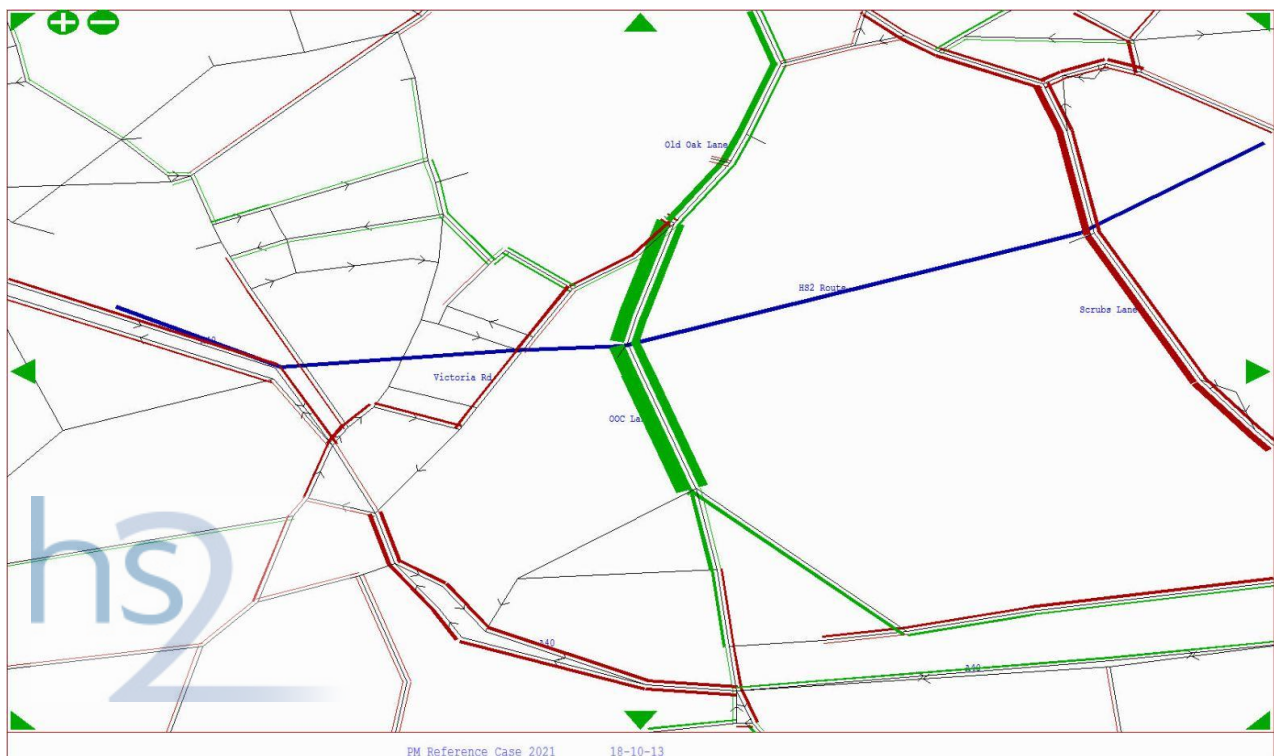
- 6.7.163 The flow plots for construction test 2 shown below illustrate more widespread impacts. However as indicated as well as closure of OOC Lane this has still assumed full construction vehicle movements (as per Scenario 1) in the modelling.

Figure 6-194: Difference in Demand Flows: 2021 construction test 2 versus 2021 Baseline AM period (at A4 size 1 mm=100pcu)



- 6.7.164 For construction test 2 in the AM period the model shows small increases in flows on Leamington Park, Friary Road and Horn Lane to the north of Friary Road, which are potential routes from Old Oak Common to the westbound A40 Westway.

Figure 6-195: Difference in Demand Flows: 2021 with Hs2 construction test 2 versus 2021 Baseline PM period.



6.7.165 In the PM period this shows a similar pattern to the AM, although with smaller increases in flow.

Summary of Link flow impacts in 2021

6.7.166 The plots above show that increases in traffic as a result of the Proposed Scheme are entirely access trips to and from construction compounds in the Old Oak Common station area in CFA4, with much lower flows arising from construction sites in CFA5.

6.7.167 In 2021, the impact of traffic accessing construction compounds in Old Oak Common area is primarily on local roads leading to and from the station with some onward movements on the strategic network. Due to the relatively low number of vehicle movements on routes that are close to capacity, there are few impacts.

Junction performance

Salisbury Road / Carlton Vale / Fernhead Road

6.7.168 Table 6-236 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small and that it operates within capacity.

Table 6-236: Construction impacts at Salisbury Road / Carlton Vale / Fernhead Road (priority junction)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Salisbury Road	1028	18	0	1033	18	0	1047	19	0
Carlton Vale	354	9	0	351	9	0	353	9	0
Fernhead Road	306	39	0	304	38	0	306	39	0
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Salisbury Road	790	14	0	789	14	0	790	14	0
Carlton Vale	463	12	0	469	12	0	474	12	0
Fernhead Road	373	49	0	374	49	0	376	49	0

Premier Corner / Kilburn Lane

6.7.169 Table 6-237 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small and that it operates comfortably within capacity

Table 6-237: Construction impacts at Premier Corner / Kilburn Lane (priority junction)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Kilburn Lane (WB)	796	14	0	791	14	0	796	14	0
Kilburn Lane (EB)	369	39	0	373	39	0	369	39	0
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Kilburn Lane (WB)	947	16	0	953	16	0	960	17	0
Kilburn Lane (EB)	357	34	0	357	34	0	352	34	0

Salisbury Road / Brondesbury Road / Harvist Road

6.7.170 Table 6-238 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small and that it operates within capacity.

Table 6-238: Construction impacts at Salisbury Road / Brondesbury Road / Harvist Road (signals)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Salisbury Road (SB)	379	59	7	379	60	7	383	60	7
Brondesbury Road	139	17	3	140	17	3	144	17	3
Salisbury Road (NB)	522	59	9	516	59	9	516	59	9
Harvist Road	196	31	4	197	31	4	201	32	4
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Salisbury Road (SB)	340	43	5	340	43	5	341	43	5
Brondesbury Road	113	19	2	113	19	2	113	19	2
Salisbury Road (NB)	569	44	9	571	44	9	571	44	9
Salisbury Road (NB)	135	26	3	135	26	3	139	27	3

Harrow Road / Scrubs Lane

6.7.171 Table 6-239 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-239: Construction impacts at Harrow Road / Scrubs Lane (signals)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Harrow Road (EB)	773	69	12	772	68	12	851	76	13
Harrow Road (WB)	659	78	10	658	78	10	696	82	10
Scrubs Lane	370	24	7	371	24	7	472	30	9
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Harrow Road (EB)	615	72	10	616	72	10	654	77	11
Harrow Road (WB)	520	65	7	518	64	7	545	68	8
Scrubs Lane	936	46	15	937	46	15	1098	55	17

Old Oak Lane / Tubbs Road

6.7.172 Table 6-240 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that in the PM peak hour the RFC on the Tubbs Road approach is already close to its practical capacity and in construction scenario 2 this increases from 89% to 93%.

Table 6-240: Construction impacts at Old Oak Lane / Tubbs Road (signals)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Station Road	497	42	3	491	41	3	342	28	2
Tubbs Road	222	55	3	222	55	3	225	55	3
Old Oak Lane	527	52	4	524	52	4	513	49	4
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Station Road	440	38	3	440	38	3	400	34	3
Tubbs Road	360	89	5	359	89	5	374	93	6
Old Oak Lane	657	65	5	655	65	5	502	51	4

Old Oak Common Lane / Du Cane Road

6.7.173 Table 6-241 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-241: Construction impacts at Old Oak Common Lane / Du Cane Road (signals)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Old Oak Common Lane (SB)	179	92	4	179	92	4	94	47	2
Du Cane Road	167	32	3	168	32	3	200	39	4
Old Oak Common Lane (NB)	664	61	9	668	61	9	640	58	7
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Old Oak Common Lane (SB)	351	77	4	352	78	4	382	86	5
Du Cane Road	189	62	4	190	62	4	191	63	4
Old Oak Common Lane (NB)	363	35	4	362	35	4	351	34	5

Old Oak Common Lane / Western Avenue / Old Oak Road (Savoy Circus)

6.7.174 Table 6-242 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small. However, without and with the Proposed Scheme the A40 operates at capacity in the AM and PM peak periods.

Table 6-242: Construction impacts at Old Oak Common Lane / Western Avenue / Old Oak Road (signals)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Old Oak Common Lane (SB)	375	77	8	375	77	8	318	65	8
A40 West Way	2,250	78	37	2,244	77	37	2,228	77	37
Old Oak Common Lane (NB)	1,547	63	18	1,545	63	18	1,555	62	18
A40 Western Avenue (EB)	3,437	102	43	3,438	102	43	3,517	103	43
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Old Oak Common Lane (SB)	463	94	10	464	94	10	504	101	11
A40 West Way	2,468	96	43	2,474	96	43	2,464	96	42
Old Oak Common Lane (NB)	1,518	61	16	1,518	61	16	1,506	61	16
A40 Western Avenue (EB)	3,075	89	40	3,073	89	40	3,153	91	41

Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road

6.7.175 Table 6-243 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small except for a large decrease in traffic on Old Oak Common Lane in test 2.

Table 6-243: Construction impacts at Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road (signals)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Atlas Road	52	24	1	93	43	2	93	43	2
Old Oak Lane	624	38	7	631	37	7	466	27	5
Old Oak Common Lane	290	62	5	303	65	5	105	20	2
Victoria Road	538	46	6	587	51	7	548	32	6
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Atlas Road	145	67	3	186	86	3	186	86	3
Old Oak Lane	619	38	7	626	38	7	575	34	6
Old Oak Common Lane	411	91	7	418	92	7	63	11	1
Victoria Road	415	26	5	472	30	5	469	28	5

Bethune Road / Victoria Road

6.7.176 Table 6-244 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-244: Construction impacts at Bethune Road / Victoria Road (priority junction)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Bethune Road	26	8	0	26	8	0	26	8	0
Victoria Road (SB)	393	30	2	418	32	3	477	37	3
Victoria Road (NB)	418	39	2	439	41	3	476	44	3
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Bethune Road	26	8	0	26	8	0	26	8	0
Victoria Road (SB)	533	42	3	554	43	3	525	41	3
Victoria Road (NB)	263	25	2	292	28	2	317	30	2

Western Avenue / Wales Farm Road / Leamington Park

6.7.177 Table 6-245 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small. However, again the A40 Western Avenue operates at capacity.

Table 6-245: Construction impacts at Western Avenue / Wales Farm Road / Leamington Park (signals)

CFA4	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Western Avenue (EB)	3,260	99	38	3,260	99	38	3,264	99	39
Wales Farm Road	1,215	42	22	1,242	43	22	1,364	47	25
Western Avenue (WB)	2,619	66	31	2,613	66	31	2,701	68	32
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Western Avenue (EB)	2,833	77	27	2,830	77	27	2,847	77	27
Wales Farm Road	1,229	50	28	1,250	51	28	1,225	50	28
Western Avenue (WB)	3,054	68	36	3,056	68	36	3,148	69	36

Friary Road / Friary Road (on boundary of CFA4/CFA5)

6.7.178 Table 6-246 below shows the performance of the junction under the two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small with a maximum change of 4% in RFC on any one arm during Construction scenario 2.

Table 6-246: Construction impacts at Friary Road / Horn Lane (priority junction)

CFA4/5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	679	88	9	677	87	9	718	92	9
Friary Road (WB)	134	32	3	134	32	3	152	36	3
Horn Lane (NB)	762	88	10	765	89	10	758	90	10
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	379	93	4	380	94	4	383	94	4
Friary Road (WB)	316	73	4	318	73	4	325	75	4
Horn Lane (NB)	479	83	6	480	83	6	495	86	6

6.7.179 Table 6-247 below lists the links that will experience substantial increases in traffic flow.

Table 6-247: Summary of links

		Increase in General Traffic		Increase in HGVs	
2021 Construction Assessment		Test 1 (Q4 2017)	Test 2 (2023/2024)	Test 1 (Q4 2017)	Test 2 (2023/2024)
CFA	Streets affected by increase	% Increase	% Increase	% Increase	% Increase
4	Victoria Road (OOC Lane to Wales Farm Road)	0%	0%	146%	148%
4	Wales Farm Road (north of A4000)	0%	0%	86%	92%

2021 Construction Assessment		Increase in General Traffic		Increase in HGVs	
		Test 1 (Q4 2017)	Test 2 (2023/2024)	Test 1 (Q4 2017)	Test 2 (2023/2024)
4	Atlas Road	0%	0%	1249%	1249%
4	OOO Lane (north of Great Western Main Line)	0%	0%	35%	0%
4	Channel Gate Road	0%	0%	347%	347%
4	St Leonard's Road	0%	54%	0%	0%
5	Friary Road	0%	0%	0%	70%
5	Friary Way	0%	35%	0%	94%
5	St Dunstan's Avenue	0%	35%	0%	94%
5	A40 (Perivale)	0%	0%	143%	139%
6	Swakeleys Road (East)	0%	0%	87%	84%
6	Swakeleys Road (South)	0%	0%	187%	187%
6	Swakeleys Road (centre)	0%	0%	65%	65%
6	Harvil Road	0%	0%	580%	580%
6	Breakspear Road South	0%	0%	118%	121%
6	Ickenham Road	0%	0%	68%	66%
6	Ladygate Lane	0%	0%	143%	180%
6	A40 Slip Road	0%	0%	154%	154%
6	Swakeleys Road Roundabout	0%	0%	121%	121%
6	Swakeleys Drive	121%	125%	0%	0%
7	M25 (Junction 16-17)	0%	0%	53%	53%
7	M40/A40 East West link	0%	0%	156%	156%
7	J16 (M25)	0%	0%	313%	313%

6.7.180 There will be traffic impacts that experience substantial increases in traffic at the following junctions during WELHAM Construction Scenario 2:

- Old Oak Lane / Tubbs Road;
- A40 Western Avenue / Old Oak Road (Savoy Circus); and
- Old Oak Common Lane / A40 Western Avenue (Savoy Circus).

6.7.181 It should be noted that although in some cases there may be HGV link flow increases, where there are no vulnerable road users (e.g. on M25 links) severance impacts would not be considered relevant or be reported, although resulting changes in noise and air quality will be, if applicable.

Accidents and safety

6.7.182 The accident data for the 36 month period from April 2009 to March 2012 in the vicinity the CFA4 worksites revealed no clusters of accidents at or near the locations of the construction compounds.

- 6.7.183 No substantial changes are anticipated as a result of the potential diversionary impacts
- 6.7.184 All new site access and egress locations will be subject to a safety assessment as part of the design process and all vehicle movements into and out of the site are to be under banksman control as necessary.

Parking and loading

- 6.7.185 The construction of the Salusbury Compound will result in the temporary loss of spaces within a pay and display car park. There will be permanent loss of a limited number of these.
- 6.7.186 The closure of Old Oak Common Lane will limit access and potential for servicing for properties on Old Oak Common Lane and off School Lane and Bethune Road
- 6.7.187 There are no other locations where a loss of car parking or loading on roads in the area is expected on that around the immediate vicinity of the works.

Rail

- 6.7.188 The strategic rail network and services in CFA4 are expected to remain unaffected during the construction stage and no permanent impacts are anticipated.
- 6.7.189 The local rail network and services in CFA4 will be unaffected during the construction stage, except during rail possessions as previously described, and mainly comprising 24 hour weekend possessions during the period February 2018- November 2022, subject to confirmation in liaison with the Network Rail.

Local bus and coach

- 6.7.190 Other than the Old Oak Common Lane closure, it is not expected that the construction of the Proposed Scheme will require any further bus route diversions or resulting delays to buses.
- 6.7.191 Construction of the proposed scheme will result in some temporary loss of pedestrian physical linkage to bus services when Old Oak Common Lane is closed.

Public transport interchanges

- 6.7.192 Public transport interchanges in CFA4 are expected to remain unaffected during the construction stage.

Pedestrians, cyclists and equestrians

- 6.7.193 The construction activities associated with the Proposed Scheme will not have a significant effect on pedestrian delay and severance in this area. Other than diversions required for OOC lane temporary closures, Bethune Road and the cut through from Wells House Road to OOC lane no other PRow or cycle diversions are anticipated and only limited pedestrian diversions will be required. There will also be no significant changes in journey ambience as there will be no increases in pedestrian crossing delays at junctions, or locations where the ambience of the crossing has been reduced. In terms of severance, no effects are anticipated during the construction of the Proposed Scheme as no roads are proposed to be closed and any pedestrian diversions associated with enabling works are anticipated to be very localised.
- 6.7.194 There are no impacts anticipated on access/egress to the Grand Union Canal.

6.7.195 There are no designated routes for equestrians in this CFA.

Kilburn (Brent) to Old Oak Common (CFA4) Proposed Scheme operation description

6.7.196 The general design of the Proposed Scheme is described in ES Volume 1, and in ES Volumes 2 section 2.

6.7.197 On the eastern side of the CFA4 area is the Salusbury Road vent shaft. With the Proposed Scheme this will effectively only have occasional maintenance vehicle movements and thus there are effectively no transport impacts associated with the operational vent shaft site except for a loss of a limited number of parking spaces from the existing surface car park.

6.7.198 The Victoria Road crossover box will also effectively have no operational impacts in terms of highway traffic movements, although there will be a permanent closure of Bethune Road as part of the permanent works. This operational section therefore focuses on the operational scheme in and around the main Old Oak Common Station site.

6.7.199 The implementation of a major new transport hub at Old Oak Common will provide access to both HS2 and other existing and planned services in the area, particularly Crossrail (completion scheduled 2018). This will thus offer substantial improvements in terms of public transport connectivity to those living and working in the area, including more than 40,000 employees currently in Park Royal to the west of Old Oak Common. Bus access on Old Oak Common Lane is currently severely constrained by headroom clearances at the rail underbridges immediately to the south of the planned Old Oak Common station which will be improved as part of the Proposed Scheme. Access to the A40 is also a key aspect of the scheme with onward connections to the motorway network, and from Old Oak Common onto HS1 and HS2 and into central London.

Old Oak Common Station

6.7.200 Old Oak Common Station will provide six high speed train platforms; two northbound, two southbound and two platforms for international services. The station will also provide an 8 platform interchange with the GWML, including Crossrail services, as well as new inter-modal facilities for onward travel as tabulated in Table 6-248 below.

Table 6-248: OOC Station Infrastructure

Mode	Infrastructure
Bus	Up to 34 buses per hour in each direction – 4 bus stops, 3 stands
Car	35 waiting spaces (10 minutes max), 4 drop off bays, 2 PRM spaces.
Taxi	12 pick up spaces, 6 drop off spaces, 3 family / PRM drop off spaces, allowing for both local commuters and typically longer distance Hs1 & Hs2 passengers.
Cycle and Pedestrian	Almost 150 cycle spaces with Cycle hire facility on site.
Permeability	East - West facing pedestrian/cycle access route is afforded by the design. North/south potential route exists - with development of fire escape bridges.
Rail Replacement	Provision would be made for a Rail replacement buses park – with allowance for provision for 3 bays and space available for more. Further rail replacement buses would utilise remote call up.

6.7.201 All HS2 trains will stop at Old Oak Common station.

- 6.7.202 During Phase One of HS2, up to 14tph will pass in each direction during peak hours. This will increase up to 19tph entering the station from the east (16tph from Euston and 3tph from the HS1 Link) and up to 18tph from the west during peak hours, when Phase Two becomes fully operational.
- 6.7.203 The trains will be either two 200m long trains coupled together or single 200m long trains, depending on demand. They will run between the hours of 05:00 and 24:00 (Monday to Saturday) and between 08:00 and 24:00 (Sunday). The station will be open for a short period before and after operating hours to allow for staff and passengers to enter or leave. When required, line inspections and maintenance will be conducted outside those operating hours.
- 6.7.204 Each train could hold up to 550 people (one-unit train) or 1,100 people (two-unit train). A proportion of the passengers will alight from the trains at the station as their final destination, or alight to transit to other transport services from the station.

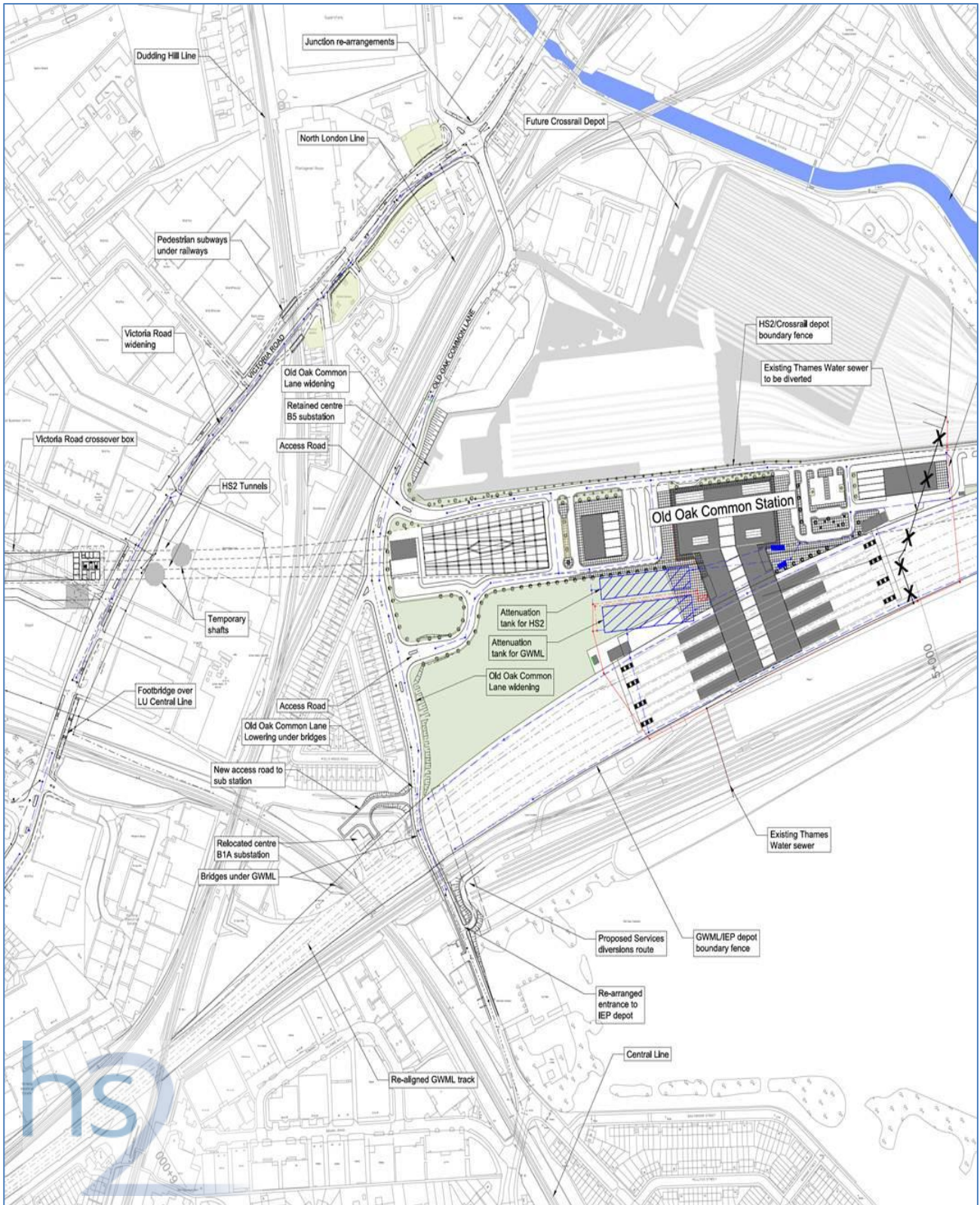
Wider Transport Network

- 6.7.205 The proposed scheme would provide improvements to the surface access transport network within the area. Figure 6-196 provides an overview of the alterations and enhancements surrounding Old Oak Common station.
- 6.7.206 Local roads would be improved with Victoria Road widened to provide four traffic lanes (including bus priority) from the junction of Old Oak Common Lane/Old Oak Lane/Atlas Road southwards to Wales Farm Road, with modifications to junctions on Old Oak Common Lane and Victoria Road.
- 6.7.207 New junctions connecting the station with Old Oak Common Lane to access the Proposed Scheme and resulting bus and general traffic flows are expected to alter local traffic patterns to a limited extent in comparison with the baseline condition. The junctions will be sufficient to service a major rail hub interchange and will take the form of a pair of multi-lane signalised accesses with controlled pedestrian and cycle facilities .
- 6.7.208 Lowering of Old Oak Common Lane under the GWML bridges would enable access for double decker buses, and help to facilitate additional bus services. And the construction of a new Pedestrian over bridge on Victoria Road above the London Underground Central Line and new underpasses and footpath re-routing will provide for additional pedestrian movements associated with the Proposed Scheme and potential for some further growth due to other subsequent development in the area (eg Park Royal Opportunity Area Planning Framework).
- 6.7.209 The station design has been sized to include sufficient concourse and platform space to accommodate passenger growth to 2041 and beyond (including HS2 Phase Two demands) and the following transport facilities as shown on TR-01-002;
- interchange offering access to key rail routes including Crossrail and HS2;
 - dedicated bus facilities;
 - dedicated taxi facilities;
 - dedicated drop-off and pick-up areas; and
 - pedestrian and cycle facilities and links.

6.7.210 Further infrastructure improvements around the station include;

- two station access routes via Old Oak Common Lane;
- significantly upgraded highway infrastructure serving the new station, including:
- new and improved traffic signalised junctions and bus stops on Old Oak Common Lane and A4000 Victoria Road; and
- widened carriageways and improved headroom clearance to allow full height bus operations under the reconstructed Old Oak Common Lane bridges; and
- new infrastructure to provide for substantial bus service frequency improvements
- re-provision of the bus depot off Atlas Road , with location to be finalised in agreement with TfL.

Figure 6-196: Old Oak Common Station Operational Uses and Layout



Kilburn (Brent) to Old Oak Common (CFA4) operation impacts

Key operation transport issues

- 6.7.211 As a result of the Proposed Scheme, rail passengers around Old Oak Common station and beyond will benefit substantially from increased capacity and improved journey times to the Midlands and beyond, with lower crowding levels on trains as a result of increases in the frequencies of trains.
- 6.7.212 The new interchange and direct access to the GWML and Crossrail services will also provide benefits for passengers from improved local accessibility and the ability to travel from the area around Old Oak Common, directly to both into London and northwards to Birmingham.
- 6.7.213 The proposed scheme will provide highway improvements that enable improved bus operation. Reconstructed bridges over Old Oak Common Lane will permit the passage of double decker buses along the length of Old Oak Common Lane, improving connectivity and allowing expanded routes to be introduced.
- 6.7.214 The Proposed Scheme will result in a limited increase in highway traffic, almost entirely as a result of access trips to and from Old Oak Common Station. This will primarily affect local roads, though some onward movement is noticeable on the Strategic Road Network (SRN). The Proposed Scheme will add highway and junction improvements to the local road network in the vicinity of the new station. At the Salusbury Road vent shaft site, around 15 car parking spaces would be permanently removed.
- 6.7.215 The Proposed Scheme would also add small numbers of additional pedestrian and cycle movements. New bridges and underpasses would be constructed to facilitate the additional demand and re-routing of the footpath on either side of Victoria Road. Bethune Road would be permanently closed, resulting in some increase in travel distance for non-motorised users.
- 6.7.216 The assessment of demand changes with the Proposed Scheme and the associated impacts on the wider transport network, including Rail, across London is covered in the sub-section on CFA1 operations. This section focuses on the impacts of the Proposed Scheme within CFA4 associated with the additional transport demand associated with the operation of Old Oak Common Station.

Changes in demand 2026 and 2041

- 6.7.217 The introduction of Old Oak Common station will introduce new passenger movements, allowing passengers to interchange between different rail services, and providing access for local passengers around Old Oak Common.
- 6.7.218 Table 6-249 below outlines the numbers of passengers using the station each day (derived from Railplan).

Table 6-249: Rail-rail interchange boarders and alighters^[1]

	2026 AM peak hour		2026 PM peak hour ^[2]		2041 AM peak hour		2041 PM peak hour ^[2]		HS1 additional trips 2041	
	Board to	Alight from	Board to	Alight from	Board to	Alight from	Board to	Alight from	Board to	Alight from
3hr peak	32,000	32,500	36,000	36,000	44,500	45,000	48,000	47,500	3,300	3,300
Peak hour	14,400	14,625	16,200	16,200	20,025	20,250	21,600	21,375	1,100	1,100

Crossrail plus NR relief line EB	63%	20%	26%	8%	57%	17%	27%	14%	0%	23%
Crossrail plus NR relief line WB	9%	23%	27%	63%	9%	23%	23%	58%	23%	0%
GWML EB	0%	40%	0%	19%	0%	38%	0%	20%	0%	26%
GWML WB	17%	0%	35%	0%	16%	0%	32%	8%	26%	0%
HS2 EB	0%	17%	0%	10%	0%	22%	0%	0%	0%	51%
HS2 WB	11%	0%	12%	0%	18%	0%	18%	0%	51%	0%
Totals	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

[1] Station exit/entrance not shown but typically 5-10% of movements

6.7.219 The information in the table above is based on modelling conducted in Railplan. However two adjustments have been made to this data:

- Railplan does not model passengers on international journeys, and so does not include the impact of HS1 services which start at Old Oak Common. It is assumed that during the peak hour one HS1 train departs the station, with 1,100 passengers. Fifty per cent of passengers are assumed to be using HS2 services for onward connectivity, 40% use classic rail and 10% enter/exit the rail network at Old Oak Common;
- Railplan does not explicitly model onward travel by taxi, private car or cycle modes. The number of passengers entering or exiting the station has therefore been uplifted using survey data to reflect the potential demand on these modes. Rail plan data was not adjusted downwards to take account of these trips.

6.7.220 A significant proportion of the interchanges involve Crossrail, with both HS2 and GWML passengers using Old Oak Common to take advantage of the interchange opportunities at the station. Crossrail is also important for local passengers who are starting or finishing their rail journey at Old Oak Common, with over half of these passengers using Crossrail.

6.7.221 It can be seen that as a proportion of the total passengers using Old Oak Common, a relatively small proportion are accessing high speed services.

Old Oak Common demand and impacts

6.7.222 The Proposed Scheme would introduce a major rail interchange station at Old Oak Common. It provides opportunities for local passengers to access HS2 services towards Birmingham, and GWML and Crossrail services into and out of London, as well as interchange opportunities for passengers on these services.

6.7.223 Table 6-250 and Table 6-251 show the expected arrivals and departures and pattern of interchange for the 2026 and for the 2041 with Phase Two services for the AM peak hour respectively.

Table 6-250: Old Oak Common station 2026 AM peak hour rail-rail interchange and station exit/access passenger flows including HS1

Departure route	Crossrail and GWML Local services	GWML Fast Services	HS2	HS1	Station exit (bus and walk)	Totals
Arrival Route						
Crossrail and GWML Local services	2,566	1,845	981	221	753	6,367
GWML Fast services	5,140	141	337	250	287	6,155
HS2	2,111	299	0	528	154	3,093
HS1	215	250	528	0	108	1,101
Station access (bus and walk)	617	104	269	101	0	1,091
Totals	10,650	2,640	2,115	1,100	1,302	17,806

Table 6-251: Old Oak Common station 2041 AM peak hour rail-rail interchange and station exit/access passenger flows including HS1

Departure route	Crossrail and GWML local services	GWML Fast Services	HS2	HS1	Station exit (bus and walk)	Totals
Arrival Route						
Crossrail and GWML Local Services	2,937	2,192	2,192	221	819	8,361
GWML Fast Services	6,520	146	819	250	332	8,067
HS2	3,115	822	0	528	328	4,793
HS1	215	250	528	0	108	1,101
Station access (bus and walk)	610	118	569	101	0	1,398
Totals	13,397	3,528	4,108	1,100	1,586	23,720

6.7.224 These tables illustrate the patterns of interchange through the station. Total arrivals on HS2 services account for less than 20% of users of the station in both 2026 and 2041, with departures some 12% of total departures in 2026 increasing to 17% in 2041. Users of GWML fast services make up some 35% of arrival in both 2026 and 2041 and 15% of departures. There is a high level of interchange between GWML services and Crossrail because Old Oak Common provides an easy and convenient link between the two. This will in turn reduce pressure on Paddington station.

6.7.225 The tables above do not include the additional allowance made for car, including kiss & ride, and taxi access that are used to assess the impact of the Proposed Scheme on the area around Old Oak Common Station.

Onward Mode Share

6.7.226 As outlined above, estimates of the additional demand created as a result of the proposed scheme and onward journeys from Old Oak Common Station have been drawn from Railplan forecasts and adjusted to take account of international passengers on HS1 and an additional allowance for taxi, private car and cycle trips which are not explicitly modelled in Railplan.

6.7.227 Mode shares for onward journeys have been determined by applying a mode split percentage derived from survey information including the Central London Termini study (TfL 2009). The resulting estimates of demand for onward travel for each mode are included in Table 6-252 below.

Table 6-252: Approximate Old Oak Common Station person trips per mode

Demand / mode	2026 Phase One	2041 Phase Two
	AM peak hour	AM peak hour
	Boarders/Alighters	Boarders/Alighters (with typical surface access mode share % 2041)
Approximate Total Passengers Through Front Door	2,700	3,360 (100 %)
Car (short-stay parking)	<10	<15 (0.5 %)
Taxi	105	140 (4.0 %)
Motorcycle	50	50 (1.5 %)
Bus	1,300	1,620 (48.0 %)
Walk / Cycle	1,030	1,300 (39.0 %)
Kiss and Ride	190	235 (7.0 %)
Total by vehicle (person trips)	305	385
Rail-rail interchange inc. HS1	15600	21500

- 6.7.228 With the introduction of the Proposed Scheme in 2026, there will be approximately 2,700 rail passengers entering or leaving the station to or from trains in the morning peak hour and around 1,990 in the evening peak hour.
- 6.7.229 In 2041 with Phase Two, these numbers will increase to approximately 3,360 passengers entering or leaving the station to or from trains in the morning peak hour and approximately 2,500 passengers in the evening peak hour.
- 6.7.230 In 2026, these passengers are forecast to generate around 305 two way person trips by vehicle (assuming i.e. total of both inbound and outbound trips) in the morning peak hour (08:00-09:00) and 230 two way trips by vehicle in the evening peak hour (17:00-18:00). In 2041, these passengers are forecast to generate around 385 two way trips in the morning peak hour and 295 two way trips by vehicle in the evening peak hour. These trips by vehicle represent only some 1.5% of total users of the station (or 11.5% of passengers through the station front door) and are small in relation to overall traffic levels. As explained later, using a car and taxi occupancy of 1.3 passengers per vehicle this equates to a maximum of nearly 300 vehicles (2way) in the busiest 2041 AM peak hour.
- 6.7.231 In terms of spatial distribution of these trips, Old Oak Common station is likely to be used to access both jobs and residential areas, with some major employment areas to the west of the station. The primary origins and destinations of surface access passenger trips which are forecast to travel through Old Oak Common station front door are shown in Table 6-253 below. Origins and destinations are broadly split across the four points of the compass. However, it is notable that the car and taxi trips are predominantly from the west, as explained later.
- 6.7.232 In terms of tidality of flows in and out of the station, the dominant direction of movement at Old Oak Common station is in exit trips from the station, largely destined for the major employment sites in Park Royal to the west of OOC. Directional distribution in the PM period is effectively the same but with tidality in the opposite direction.

Table 6-253: Distribution of Onward Trips Generated from Old Oak Common Station (All Modes, AM peak hour)

Origin/Destination	Percentage	2026 AM		2041 AM	
		Boarders	Alighters	Boarders	Alighters
North	22%	276	328	354	400
South	27%	330	392	423	478
East	23%	289	343	370	418
West	27%	336	400	432	487
Total	100%	1231	1463	1579	1783
	tidality	46%	54%	46%	54%

Bus flows & facilities

- 6.7.233 The Proposed Scheme will include bus facilities at Old Oak Common station and new interchange opportunities. Reconstructed bridges over Old Oak Common Lane will permit the passage of double deck buses along the full length of Old Oak Common Lane, improving connectivity and allowing new and expanded routes to be introduced. A total of 34 buses per hour are assumed to serve the new station, with extensions to routes 7, 72, 283 and 487 adding to the existing route 228.
- 6.7.234 It is expected that the majority of bus users will be to and from the south of the station, as shown in Table 6-254, gaining particular benefits from the improved access and the potential for improved services to the wider area.

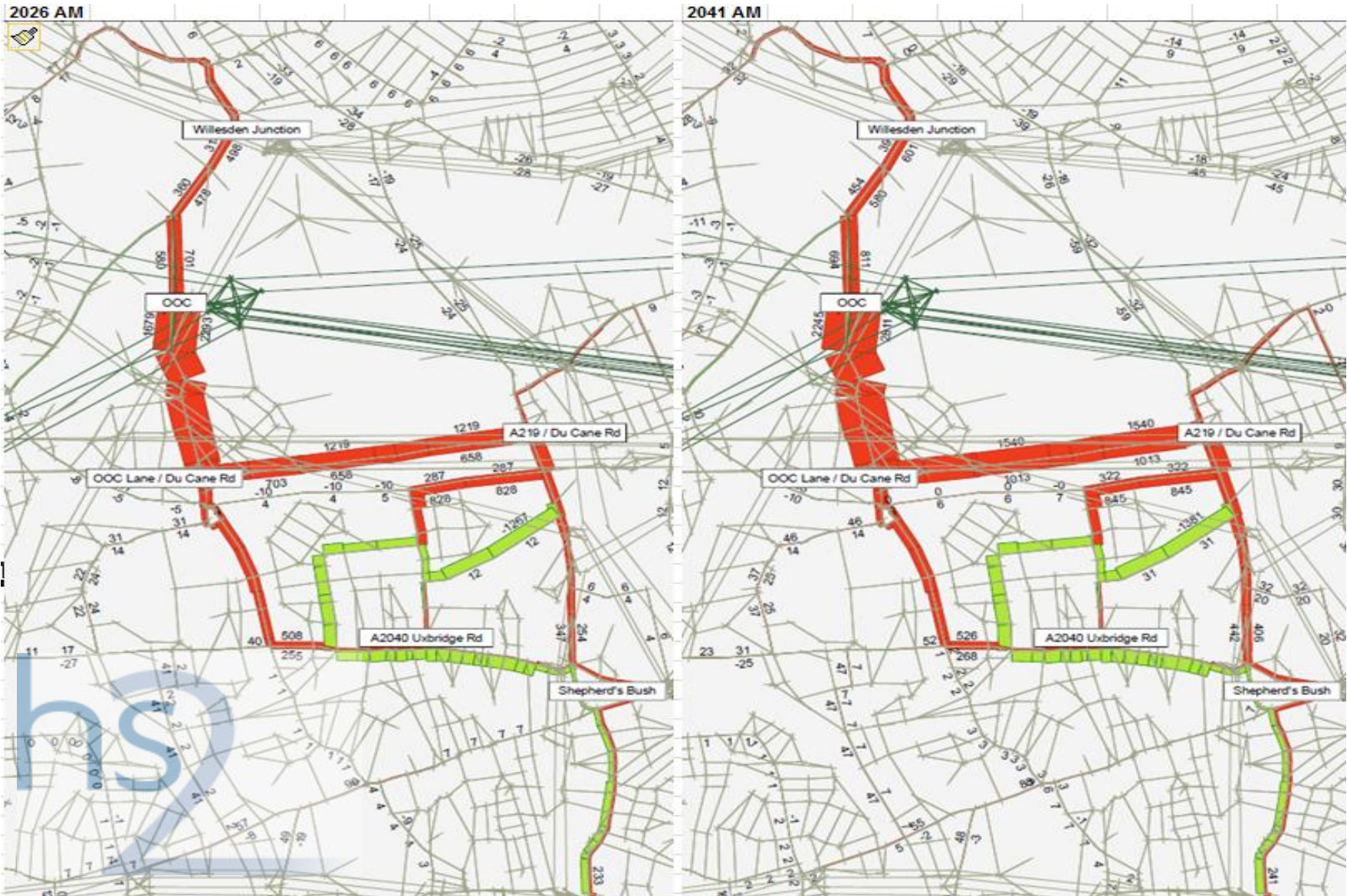
Table 6-254: Distribution of Onward Bus Trips Generated Old Oak Common Station (AM peak hour)

Origin/Destination	Percentage	2026 AM		2041 AM	
		Boarding trains/alighting buses	Alighting trains/boarding buses	Boarding trains/alighting buses	Alighting trains/boarding buses
North	17%	100	119	129	146
South	37%	219	260	280	317
East	30%	177	211	227	257
West	16%	95	112	121	137
	Total	591	702	758	856
	Total 2 way	1293		1614	

- 6.7.235 Passengers using Old Oak Common Station will add around 1,300 additional trips (2 way) on buses in the area in 2026 AM peak hour increasing to just over 1600 additional trips in 2041 (ie 758 alighting buses and 856 boarding buses).
- 6.7.236 This additional demand would largely be met by the major uplift in services along Old Oak Common Lane from the existing 12 up to 34 buses per hour in 2041. The maps below in Figure 6-197 show how this demand would be distributed across the network in 2026 and 2041. Note that these are shown as 3 hr totals as output from Railplan.

- 6.7.237 There will be a significant increase in bus passenger volumes on Old Oak Common Lane and the Du Cane Road, driven by the new option to access rail services on the Great Western Main Line including Crossrail. Most routes experience a modest increase in local demand – particularly between Old Oak Common station and the White City area.
- 6.7.238 The overall pattern of bus passenger change is driven by the new and improved accessibility to key attraction areas around Shepherd's Bush and White City, including the Westfield shopping centre. As such we see that with the Proposed Scheme passengers shift to using rail to/from Old Oak Common station and transferring to local bus. In the baseline these passengers would tend to use underground services to Hammersmith before using local bus to their final destination.

Figure 6-197: Changes in Bus Passenger loadings from 2026 & 2041 Forecast Baseline (AM peak 3 hr)



6.7.239 The plots above in Figure 6-197 provide a geographical illustration of how the Proposed Scheme changes demand on the bus corridors around Old Oak Common station. Table 6-255 and Table 6-256 provides a summary of these impacts.

Table 6-255: Difference in Bus Demand Passenger Flows: AM 2026 Baseline vs AM 2026 with Proposed Scheme

Link	Change factor	AM peak hour change	
		Towards OOC	Away and From OOC
Scrubs Lane / Mitre Bridge	Change (in passengers)	-12	-11
	Change (in approximate buses per hour)	0	0
Old Oak Common Lane / The Fairway	Change (in passengers)	662	910
	Change (in approximate buses per hour)	0	0
Du Cane Road / Wood Lane	Change (in passengers)	296	519
	Change (in approximate buses per hour)	0	0
Old Oak Lane / Webb Place	Change (in passengers)	215	142
	Change (in approximate buses per hour)	4	4
Victoria Road / Chandos Road	Change (in passengers)	-28	-44
	Change (in approximate buses per hour)	0	0
Old Oak common Lane/Wells House Road	Change (in passengers)	676	931
	Change (in approximate buses per hour)	25	25

6.7.240 In the AM peak this shows main impacts on Old Oak Common Lane stops and on Du Cane Road to the south of the station, which will benefit greatly from the major improvements in accessibility to the area. A similar pattern occurs in the PM peak. Although not shown there is considerable flexibility to revise bus schedules in the area to optimise operations.

Table 6-256: Difference in Bus Demand Flows: AM 2041 Reference Case vs AM 2041 with Hs2

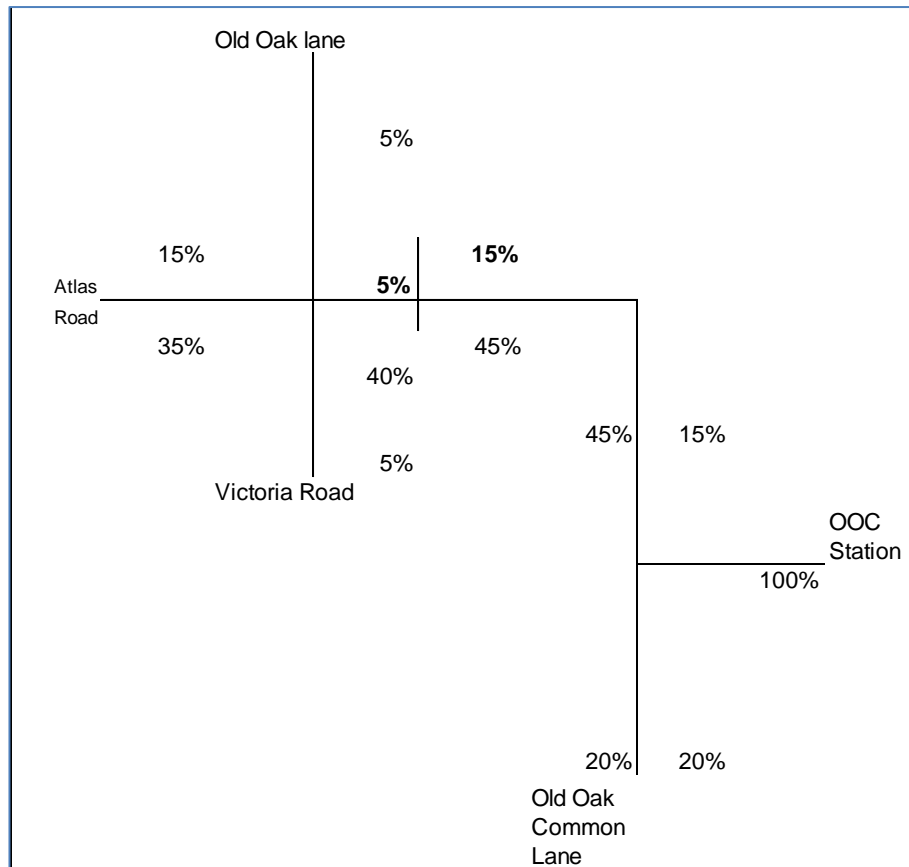
Link	Change factor	AM peak period change	
		Towards OOC	Away and From OOC
Scrubs Lane / Mitre Bridge	Change (in passengers)	-26	-11
	Change (in approximate buses per hour)	0	0
Old Oak Common Lane / The Fairway	Change (in passengers)	898	1120
	Change (in approximate buses per hour)	0	0
Du Cane Road / Wood Lane	Change (in passengers)	456	644
	Change (in approximate buses per hour)	0	0

Link	Change factor	AM peak period change	
		Towards OOC	Away and From OOC
Old Oak Lane / Webb Place	Change (in passengers)	261	177
	Change (in approximate buses per hour)	4	4
Victoria Road / Chandos Road	Change (in passengers)	-18	-47
	Change (in approximate buses per hour)	0	0
Old Oak common lane/Wells House Road	Change (in passengers)	916	1145
	Change (in approximate buses per hour)	25	25

Pedestrians

- 6.7.241 The proposed scheme will provide a series of improved pedestrian footpaths, with a new pedestrian footbridge on Victoria Road above the London Underground Central Line, and new pedestrian underpasses on Victoria Road under the Cricklewood and Acton Wells Line to allow for re-routing of the existing footpath. Improvements to the junction of Victoria Road/Old Oak Common Lane/Old Oak Lane/Atlas Road, by providing widening on the Victoria Road arm and an additional lane on the southbound Old Oak Lane, will provide additional highway capacity whilst accommodating increased pedestrian flows at the junction.
- 6.7.242 To the south of this junction the closure of Bethune Road will result in a nominal increase in travel distance for a small number of pedestrians.
- 6.7.243 The Proposed scheme also includes for the minor realignment of the steps on the pedestrian footpath from Old Oak Common Lane linking to Wells House Road.
- 6.7.244 The proposed scheme will increase the number of pedestrian movements in the vicinity and on the highway approaches to the new station at Old Oak Common, with around 1000 additional pedestrians travelling to or from Old Oak Station in the morning peak hour. This rises to 1,200 by 2041.
- 6.7.245 Existing flows in the area were determined by Hs2 as part of the 2012 survey programme (see Traffic Survey Baseline report), and the forecast flows generated by the scheme have been added to these. Although existing pedestrian flows are relatively low, no reduction in forecast baseline flows has been made for removal of existing land uses that may be partially or fully replaced as part of the scheme. This is, for example, relevant to the Victoria road Crossover box and Main Tunnel drive sites. The pedestrian flow analysis thus considers a reasonable worst case scenario.
- 6.7.246 The distribution of pedestrian flows with the Proposed Scheme has been determined from existing flows at the junction and the forecast of overall demands considering the current employment uses in the area. The distribution is illustrated in Figure 6-198, and shows some 60 percent of movements to/from north and west of OOC, with more using the west side of Old Oak Common Lane (ie 45%) as opposed to the east side (15%), and 5% using the crossing on the east arm of the Victoria Road junction.

Figure 6-198: Distribution of pedestrian movements in vicinity of Old Oak Common Station (all time periods)



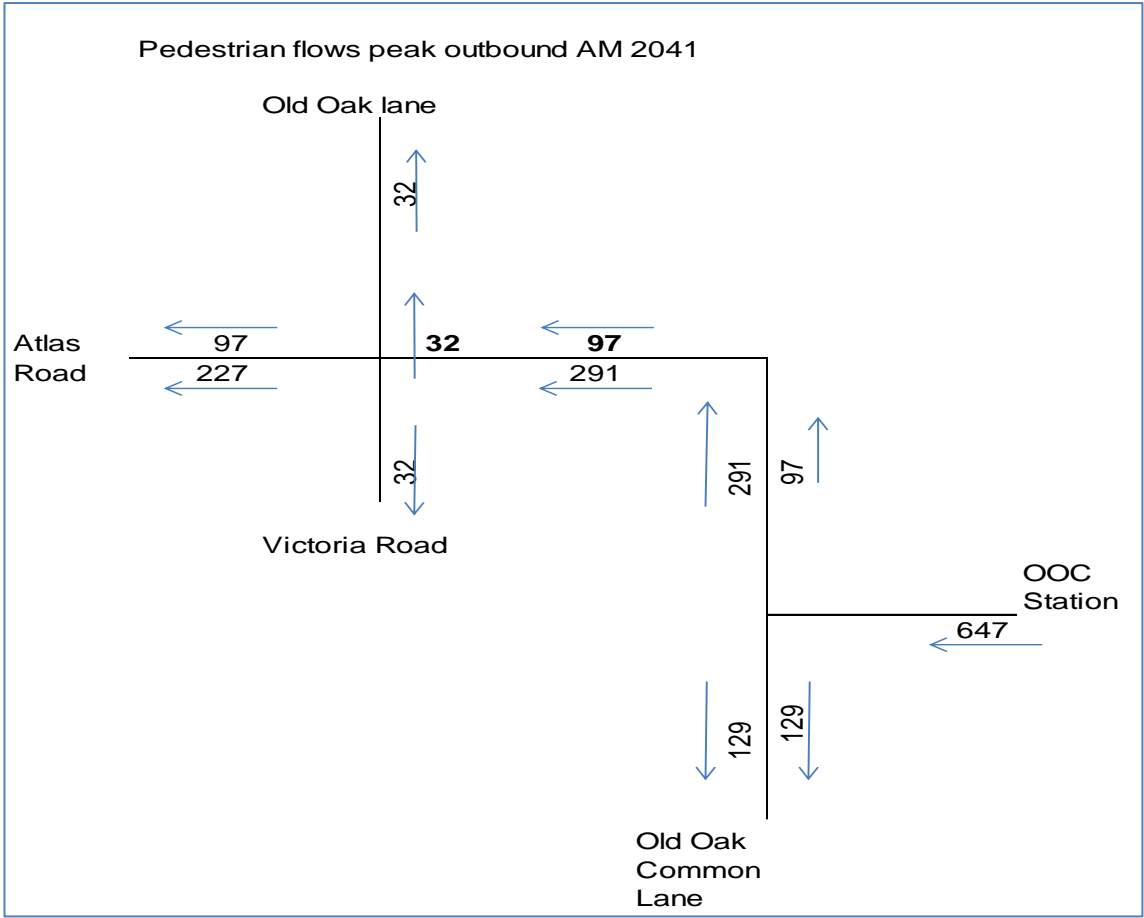
6.7.247 Flows have been disaggregated to estimate the direction of trips. A 54:46 (station exit: station entry) tidality factor for the AM peak was applied based on analysis of Railplan data. Table 6-257 below shows the resulting flows for the busiest 2041 AM peak hour. Of almost 1,200 pedestrian movements in the AM peak hour in 2041 (Phase 2), there would be around 650 outbound pedestrians and 550 inbound towards the station. The reverse flow would occur in the PM peak hour.

Table 6-257: Old Oak Common station pedestrian flows 2041 peak hour

Period	Total peds 2 way 2041	Directional %		Directional flow	
		In	Out	In	Out
AM	1,205	0.46	0.54	551	647
PM	895	0.54	0.46	483	411

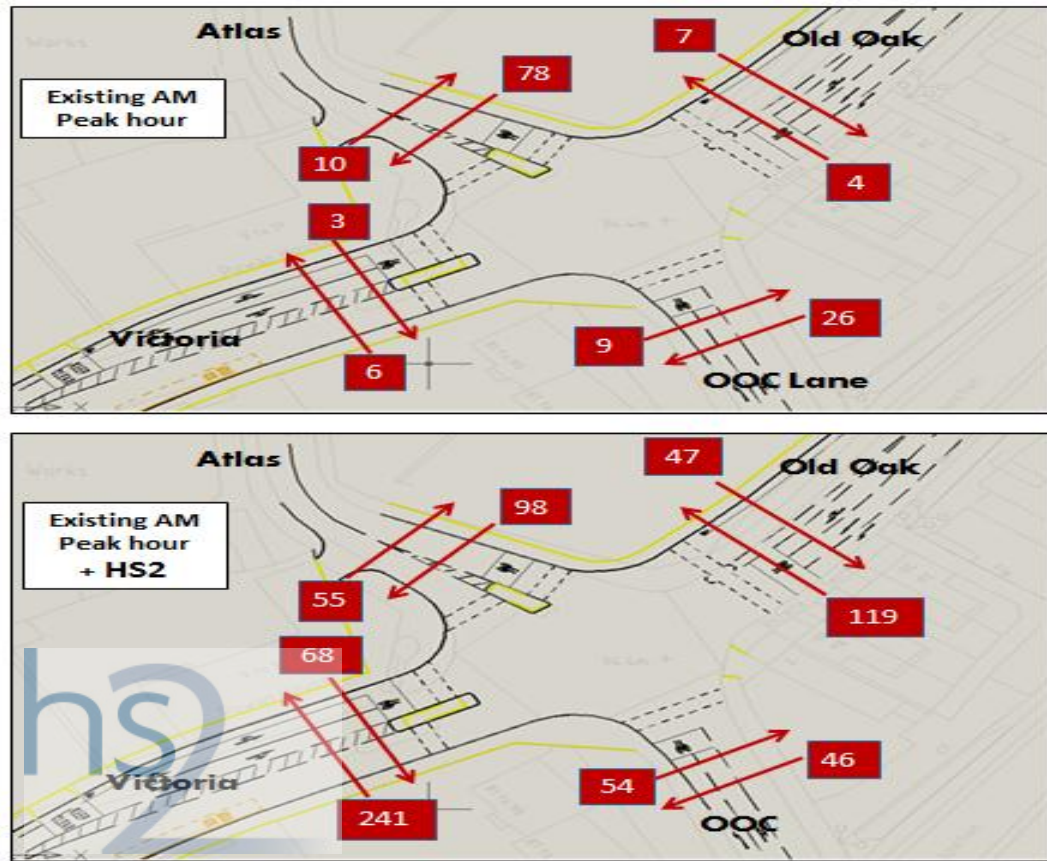
6.7.248 The distribution of pedestrians was then applied to these estimated flows to calculate the distribution of pedestrians walking to and from Old Oak Common station. Figure 6-199 shows this distribution of the 2041 AM peak hour for outbound flows as representing the highest overall directional flows.

Figure 6-199: Pedestrian peak directional flows : 2041 AM outbound from Old Oak Common Station



- 6.7.249 As indicated the pedestrian flows are superimposed on existing flows, with an average of at least 15-20% % uplift in base flows to reflect background growth to 2041 (almost twice that estimated for traffic growth). It is noted that some of the local land uses (such as the existing offices on the east side of Victoria Road) will in fact be permanently removed as part of the Hs2 Proposed Scheme implementation, and thus this approach represents a realistic most severe case.
- 6.7.250 This approach provided the assessment of overall pedestrian crossing movements at the Victoria Road/Old Oak Common Lane junction in the area.

Figure 6-200: Pedestrian crossing flows (AM peak) Old Oak common Lane/Victoria Road junction



6.7.251 The analysis shows that even the busiest crossing location with HS2 on the south side of the Victoria Road/Old Oak Common Lane/Atlas Road junction will carry under 250 pedestrians from east to west per hour within the "green man" phase of a minimum of 20 minutes per hour, including the "all-red" phase. Over the minimum kerb crossing width of 2 metres, this equates to 6 pedestrians per metre per minute (ppmm), resulting in a Pedestrian Comfort Level (PCL) category A-.

Figure 6-201: Typical Pedestrian Comfort Level (PCL) Category A



6.7.252 At this level of usage the pedestrian environment is very comfortable with plenty of space for people to walk at the speed and the route they choose.

Cycles

- 6.7.253 The Proposed Scheme would provide additional cycling facilities at Old Oak Common Station, with some 150 spaces proposed at the station. The overall highway works include a package of improvements and cycle measures to assist in linking to the wider area and integrating with other modes.
- 6.7.254 The measures may be summarised as;
- new fully signalised junctions on Old Oak Common Lane with shared cycle footways in the vicinity of the station and extending southwards towards Wormwood Scrubs Park
 - improvement scheme at Victoria Road/Old Oak Common Lane junction to facilitate flows including to and from the canal towpath.
 - widened Victoria Road with bus and shared cycle lanes to improve flow and safety on the main route for road traffic to the A40.
- 6.7.255 Although not required as part of the scheme, there is potential to link to improved cycle facilities at the A40 junctions as part of the Mayors cycle strategy.
- 6.7.256 In the existing baseline, there are around 33 cycles in total on Old Oak Common Lane (June/July “high” season) in the AM peak hour. Cycle movements are distributed approximately 25-30% in each direction at the junction of Old Oak Common Lane and/ Victoria Road.
- 6.7.257 Analysis of the Proposed Scheme suggests that Old Oak Common station would generate up to 100 new cycle trips (2-way) in the AM peak hour (ie an average of 50 inbound and 50 outbound).
- 6.7.258 To provide a reasonable worst case for the assessment of the impact of the Proposed Scheme, it was assumed some 60% of cycle movements were to/from north and west (i.e. only 30% to south). In reality there is likely to be a greater proportion to/from south to locations such as East Acton residential area, particularly with 5 other stations in the area, and major enhancement in bus services (12 buses increasing to 34 per hour each way).
- 6.7.259 This implies the Proposed Scheme generates an extra 30 cyclists per hour each way (ie 60 2-way) at Old Oak Common Lane/Victoria Rd junction travelling to/from Old Oak Common Lane with cycle advance stop lines at junctions. This equates to approximately one extra cyclist per 2 minutes in each direction and is well within capacity of the closest main junction at OOC / Victoria Road junction. New fully signalised junctions on Old Oak Common Lane would also enable vehicle speeds to be managed providing safer environment.
- 6.7.260 It is possible that with the planned Old Oak Common OAPF there may be increased demand for walk and cycle trips and the routing and demand of these will depend on the associated OAPF infrastructure (highway and public transport). There is also an opportunity to provide further traffic management in the area of Old Oak Common Lane with the OAPF.

Strategic & Local Road Network

- 6.7.261 As illustrated in Figure 6-196 and described above the highway improvements forming part of the scheme include;

- Headroom and alignment improvements and new access junctions on Old Oak Common Lane and on Victoria Road
- Highway link improvements and increased bus & cycle priority on Victoria Road
- Pedestrian crossing facilities at junctions

6.7.262 The assessment of the vehicular trips and impact on the existing and proposed infrastructure is set out below

Car and taxi trips

6.7.263 Although only very limited short-stay parking will be provided, kiss and ride and taxi access will be available. Forecasts of onward journey mode split suggest around 305 trips (two way) during the AM peak hour in 2026, rising to 385 trips by 2041 (Phase 2).

6.7.264 As indicated above, analysis of Railplan data indicates that of the 305 trips in the am peak hour in 2026, around 165 would be outbound trips, and 140 inbound. The estimates of passenger trips are shown in Table 6-258.

Table 6-258: Old Oak Common station vehicle person trips (2 way)

Forecast year	2026		2041	
Time period	AM peak hour	PM peak hour	AM peak hour	PM peak hour
Total trips by vehicle	305	230	385	295
Car in	92	81	115	105
Car out	108	69	135	90
Car (person trips) total	200	150	250	195
Taxi in	48	43	62	54
Taxi out	57	37	73	46
Taxi total (trips)	105	80	135	100

6.7.265 However, vehicle occupancy rates at 1.3 were applied to estimates of the generated passenger trips for car (short stay), kiss and ride, and taxi modes, resulting in the vehicle trips shown in Table 6-259 and Table 6-260.

Table 6-259: Old Oak Common station car (Vehicles 1-way)

	2026AM	2026PM	2041 AM	2041 PM
Car (Vehs)	154	115	192	150
CAR in	71	62	88	81
Car out	83	53	104	69

6.7.266 The Proposed Scheme would provide 12 pick-up spaces, 6 drop off spaces, 3 family / BlueBadge or PRM (Persons Reduced Mobility) drop off spaces. The Proposed Scheme is likely to generate some

additional demand for taxi trips, with an estimated 110 additional taxi passengers (overall 2 way) in the am peak hour in 2026 (Phase 1), rising to 140 in 2041 (Phase 2). The 135 trips by taxi (2-way) equates to 56 taxis per hour in the peak direction.

Table 6-260: Old Oak Common Station Taxi Flows (Vehicles 1-way)

Vehicles	2026 AM	2026PM	2041 AM	2041 Pm
Taxi in	37	33	48	42
Taxi out	44	28	56	35

6.7.267 The distribution of car & taxi trips over the wider area is illustrated in Table 6-261 below. The impact of these additional trips is incorporated into the overall assessment of impacts on the highway network. Highway trips generated by Old Oak Common Station have been distributed on to the highway network based on analysis of current trip distribution of trips to / from local zones as summarised in Table 6-261.

Table 6-261: Overall Old Oak Common Station Car & Taxi Distribution

Origin/Destination	Percentage
North	20%
South	10%
East	10%
West	60%

- 6.7.268 The assignment of the car & taxi trips results in a maximum of 104 cars and 56 taxis leaving the Station in 2041 in the morning peak hour, with nearly 80 percent of these using the improved Old Oak Common Lane / Victoria Road junction.
- 6.7.269 It should be noted that for intermodal facilities design purposes (and with substantial allowance for potential further growth arising from potential OAPF developments) taxi flows of up to 150 taxis per hour were assumed for the Interim Preliminary Design.
- 6.7.270 Adopting a 6m taxi length, this would require an equivalent 900m kerb length overall. With a gom taxi stand (ie 15 taxis each bay would thus need to turn over 10 times per hour (i.e. average 6 minute taxi stand time). Variation in stand time or rank length would affect capacity. It is anticipated that any taxi queuing in excess of stand capacity would utilise a remote call-up, in order to avoid any interference with movements near the station approaches.
- 6.7.271 The above analysis is summarised in Table 6-262 and shows that as a maximum there will be under 300 total car and taxi vehicle movements overall (2 way) in the AM peak in 2041. As indicated above there are estimated to be nearly 160 vehicles in the peak (outbound) direction in 2041.

Table 6-262: Old Oak Common station vehicle movements (2 way)

	2026 AM	2026 PM	2041 AM	2041 PM
vehicle occupancy	1.3	1.3	1.3	1.3
Car (parked)	8	8	12	12
Taxi	81	62	104	77
Kiss and Ride	146	108	181	138
total vehs	235	177	296	227

- 6.7.272 In addition to these passenger trips, the station is also expected to employ 150-300 staff. The modal split for the Old Oak Common station operational staff has been based on the same distribution as passengers using the station, bearing in mind data from existing census data would not necessarily reflect the major improvements in accessibility brought about by the new station.
- 6.7.273 Furthermore as with the majority of London stations, even though only a relatively small number of trips, operational staff would be expected to be on site during peaks hours, thus travelling outside the peak periods.
- 6.7.274 The station will also attract a number of delivery vehicles. The following table summarises the forecast daily delivery vehicle movements.

Table 6-263: Number of Deliveries at the Old Oak Common

Hour (Beginning)	Arrive	Depart
07:00	0	0
08:00	2	2
09:00	2	2
10:00	4	4
11:00	4	4
12:00	4	4
13:00	4	4
14:00	4	4
15:00	4	4
16:00	2	2
17:00	2	2
Total (maximum)	32	32

Delivery vehicles are assumed to arrive and depart via the strategic network due to the specialist nature of the operations.

- 6.7.275 The resulting impact due to operational and delivery traffic to Old Oak Common Station will be minimal.

Highway flow impacts 2026 & 2041

- 6.7.276 The highway assignment uses the above flows added to the overall background flows in WELHAM for the 2026 & 2041 Operational scenario AM and PM peak hour and are tabulated in the sections below.

- 6.7.277 Future baseline traffic volumes in the peak hours are forecast to grow by typically 4.5 to 5.5% by 2026 compared to 2012, and by 8.5-9.5% by 2041 compared to 2012.
- 6.7.278 The flows are shown for the wider area along the line of the HS2 corridor covering CFA4 to CFA6 as a means of identifying both strategic and more localised impacts. For assessment purposes Heavy Vehicles include both normal HGV's and buses.
- 6.7.279 It should be noted that the traffic flow plots are presented as standard model output in Passenger Car Units (pcus - representing the equivalent of 1 car), whilst the link flow tabulations below are in vehicles.
- 6.7.280 The junction assessments which follow the link flow assessments are presented in pcus as is normal practice. Local models, such as TRANSYT, were prepared for the Old Oak Common area and were used to optimise traffic signal settings.
- 6.7.281 The results of the highway assignment using the above flows added to the overall background flows in WELHAM for the 2026 Operational scenario AM and PM peak hour are tabulated in Table 6-264 and Table 6-265, with the results for CFA5 and CFA6 shown for comparison.

Table 6-264: WELHAM highway assignment CFA4-6 AM 2026 Operation

WeLHAM AM Flows (Vehicles)	Direction	Future Baseline 2026		2026 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
CFA4									
Kilburn High Road (south of Belsize Road)	NB	653	68	644	68	-9	0	-1%	0%
	SB	209	48	208	48	-2	0	-1%	0%
Salisbury Road (north of Premier Corner)	NB	503	9	519	10	17	0	3%	5%
	SB	475	10	476	11	1	0	0%	1%
Premier Corner (north of Kilburn Lane)	NB	976	58	992	58	16	0	2%	1%
Chamberlayne Road (north of Kilburn Lane)	NB	371	63	368	63	-3	0	-1%	0%
	SB	485	79	479	78	-6	-1	-1%	-1%
Harrow Road (west of College Road)	WB	422	24	417	25	-4	1	-1%	4%
	EB	368	44	369	45	1	1	0%	2%
Scrubs Lane (north of Hythe Road)	NB	400	34	430	35	30	1	7%	3%
	SB	767	60	809	60	42	0	5%	0%
Old Oak Common Lane	NB	240	27	178	44	-62	17	-26%	64%

	Direction	Future Baseline 2026		2026 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
WelHAM AM Flows (Vehicles) (north of Wulfstan Street)	SB	460	30	326	47	-134	17	-29%	57%
Old Oak Common Lane (south of Du Cane Road)	NB	586	37	624	29	38	-8	6%	-21%
	SB	343	32	349	28	5	-4	1%	-13%
Wales Farm Road	SB	1,117	142	1,194	146	77	4	7%	2%
Victoria Road (north of Park Royal Road)	NB	1,098	116	1,120	120	22	4	2%	3%
Park Royal Road	NB	442	39	455	40	14	1	3%	2%
	SB	340	62	342	63	2	1	1%	1%
CFA5									
Coronation Road	EB	238	14	239	15	0	1	0%	6%
	WB	34	10	34	10	0	0	0%	0%
Connell Crescent bridge	EB	370	8	373	8	3	1	1%	8%
	WB	15	0	15	0	0	0	2%	0%
Hanger Lane East Bridge	SB	5,055	304	5,067	304	12	0	0%	0%
Hanger Lane West Bridge	NB	4,639	237	4,665	236	25	-1	1%	0%
Alpertown Lane	NB	551	1	552	1	0	0	0%	1%
	SB	382	37	382	37	0	0	0%	-1%
Bideford Avenue	NB	311	10	310	10	0	0	0%	0%
	SB	422	26	423	26	1	0	0%	0%
Horsenden Lane	NB	249	8	248	8	-1	0	0%	0%
	SB	257	24	256	24	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	417	16	420	16	3	0	1%	-1%
	SB	548	8	548	8	0	0	0%	-1%
Greenford Road (south of Uneeda Drive)	NB	823	83	825	83	1	0	0%	0%
	SB	856	65	855	65	-1	0	0%	0%

WeLHAM AM Flows (Vehicles)	Direction	Future Baseline 2026		2026 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
Oldfield Lane (north of Uneeda Drive)	NB	344	19	342	19	-2	0	-1%	0%
	SB	627	24	626	24	-1	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1,244	41	1,245	41	1	0	0%	0%
	SB	831	35	832	35	1	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1,166	59	1,168	59	2	0	0%	0%
	SB	999	51	1,001	51	2	0	0%	0%
Eastcote Lane	EB	655	14	655	14	0	0	0%	0%
	WB	342	12	342	12	1	0	0%	1%
CFA6									
West End Road	NB	674	30	675	29	0	-1	0%	-2%
	SB	491	26	491	26	0	0	0%	0%
Ickenham Road	NB	737	26	734	26	-3	0	0%	0%
	SB	1,146	63	1,147	63	1	0	0%	-1%
Breakspear Road	NB	553	14	554	14	1	0	0%	0%
	SB	667	18	667	18	-1	0	0%	0%
Harvil Road	NB	336	19	336	20	0	0	0%	1%
	SB	509	17	511	17	2	0	0%	1%
Swakeleys Road (south)	NB	1,619	87	1,615	87	-4	0	0%	0%
	SB	1,626	114	1,627	114	1	0	0%	0%

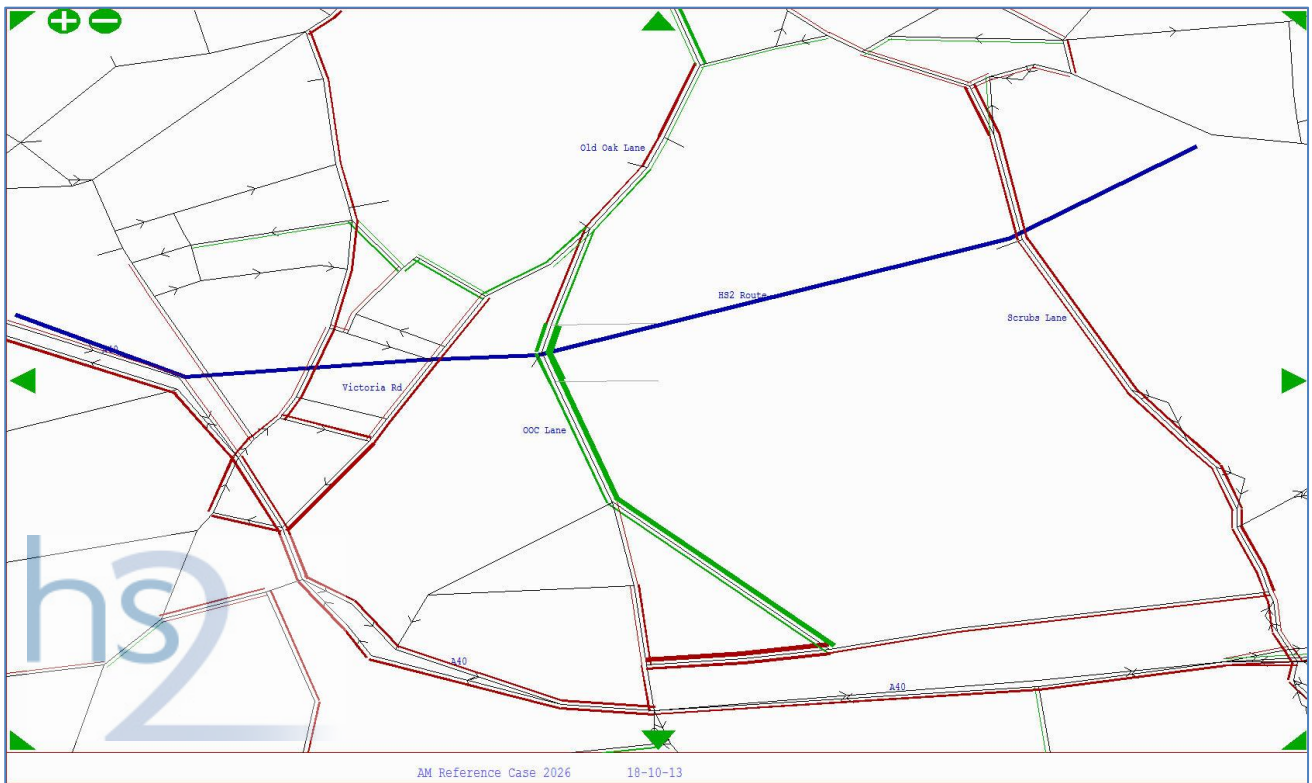
Table 6-265: WELHAM highway assignment CFA4-6 PM 2026 Operation

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WelHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
CFA4									
Kilburn High Road (south of Belsize Road)	NB	552	56	554	57	2	0	0%	1%
	SB	322	46	322	46	0	0	0%	0%
Salisbury Road (north of Premier Corner)	NB	544	7	557	7	13	0	2%	3%
	SB	369	10	372	10	4	0	1%	1%
Premier Corner (north of Kilburn Lane)	NB	981	38	989	38	8	0	1%	1%
Chamberlayne Road (north of Kilburn Lane)	NB	646	66	650	66	4	1	1%	1%
	SB	488	51	489	51	2	0	0%	0%
Harrow Road (west of College Road)	WB	550	27	556	28	6	0	1%	1%
	EB	440	22	426	22	-13	0	-3%	2%
Scrubs Lane (north of Hythe Road)	NB	946	38	953	38	7	-1	1%	-1%
	SB	462	26	509	25	46	-1	10%	-2%
Old Oak Common Lane (north of Wulfstan Street)	NB	408	30	385	53	-23	23	-6%	77%
	SB	223	15	156	41	-67	25	-30%	163%
Old Oak Common Lane (south of Du Cane Road)	NB	331	26	361	23	30	-3	9%	-13%
	SB	440	25	449	24	9	-1	2%	-3%
Wales Farm Road	SB	1,261	56	1,354	57	93	1	7%	2%
Victoria Road (north of Park Royal Road)	NB	847	46	896	45	49	0	6%	-1%
Park Royal Road	NB	376	44	403	46	27	2	7%	4%
	SB	417	24	427	24	10	0	2%	0%
CFA5									
Coronation Road	EB	128	11	140	12	13	1	10%	13%
	WB	65	10	66	10	0	0	0%	0%
Connell Crescent bridge	EB	140	3	152	5	12	1	9%	44%
	WB	45	0	45	0	0	0	0%	0%
Hanger Lane East Bridge	SB	4,746	145	4,816	144	69	-1	1%	-1%

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WelHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Baseline All Vehicles	Baseline HGV	Baseline All Vehicles %	Future Baseline HGV %
Hanger Lane West Bridge	NB	4832	148	4893	147	61	-1	1%	-1%
Alperton Lane	NB	400	0	397	0	-3	0	-1%	2%
	SB	318	2	321	2	3	0	1%	0%
Bideford Avenue	NB	234	8	234	8	0	0	0%	-3%
	SB	682	24	681	24	-1	0	0%	0%
Horsenden Lane	NB	321	13	318	13	-4	-1	-1%	-5%
	SB	297	8	297	8	0	0	0%	-1%
Greenford Road (north of Uneeda Drive)	NB	517	2	517	2	0	0	0%	-3%
	SB	499	2	504	2	4	0	1%	-3%
Greenford Road (south of Uneeda Drive)	NB	995	37	994	37	-2	0	0%	0%
	SB	948	40	952	40	4	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	618	17	612	17	-6	0	-1%	0%
	SB	484	13	482	13	-2	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1,183	26	1,185	26	2	0	0%	0%
	SB	830	21	822	21	-7	0	-1%	0%
Mandeville Road (south of Eastcote Lane)	NB	1,473	32	1,473	32	0	0	0%	0%
	SB	506	33	500	33	-6	0	-1%	0%
Eastcote Lane	EB	635	8	634	8	-1	0	0%	0%
	WB	490	10	490	10	0	0	0%	0%
CFA6									
West End Road	NB	870	11	869	11	-1	0	0%	1%
	SB	616	10	616	10	-1	0	0%	-1%
Ickenham Road	NB	1,100	23	1,103	23	3	0	0%	0%
	SB	912	21	912	21	0	0	0%	0%
Breakspear Road	NB	768	8	765	8	-2	0	0%	0%
	SB	544	10	544	10	-1	0	0%	-1%
Harvil Road	NB	387	16	387	16	0	0	0%	0%
	SB	449	9	447	9	-2	0	0%	0%
Swakeleys Road (south)	NB	1,460	134	1,457	134	-3	0	0%	0%
	SB	1,377	75	1,374	75	-3	0	0%	0%

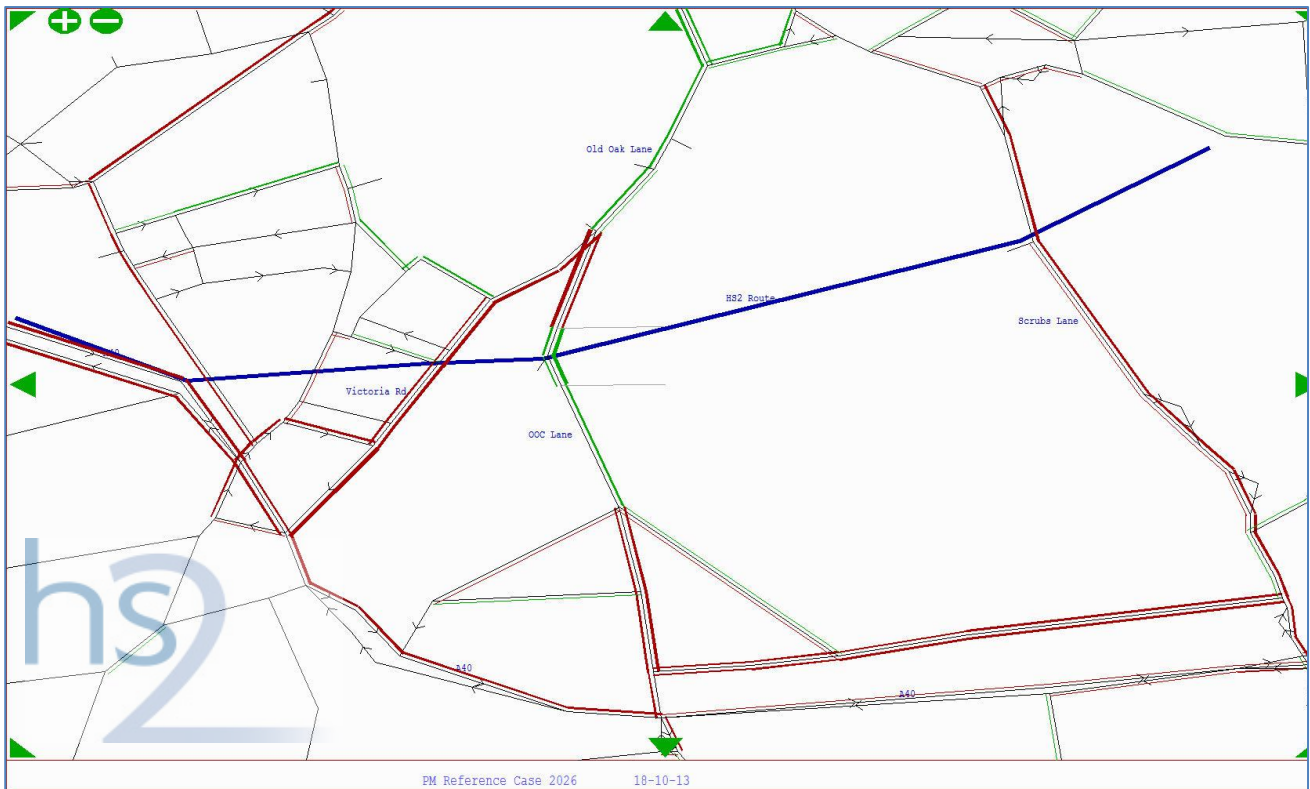
6.7.282 The results of the highway assignment for the 2026 Operational scenario AM and PM periods are illustrated in Figure 6-202 and Figure 6-203.

Figure 6-202: Difference in Demand Flows: 2026 with Hs2 operation minus 2026 Baseline AM period (at A4 size 1 mm=100pcu)



6.7.283 In the AM period this shows a slight reduction in flows on Old Oak Common Lane largely due to the effect of the new access junctions into the station and the additional buses slightly increasing the overall travel time on the route for general traffic.

Figure 6-203: Difference in Demand Flows: 2026 with Hs2 operation minus 2026 Baseline PM period.



- 6.7.284 In the PM period this shows a similar pattern to the AM but with increased impacts on Victoria Road.
- 6.7.285 The plots above show that increases in traffic as a result of the Proposed Scheme are almost entirely due to access trips to and from Old Oak Common station, and diversionary impacts of the new and modified junctions on Old Oak Common Lane, including the Victoria Road junction. Elsewhere at the shaft sites, occasional traffic may access areas of the Proposed Scheme for maintenance and servicing purposes, and these infrequent vehicle movements will be very low.
- 6.7.286 In 2026, the impact of traffic accessing Old Oak Common station is primarily on local roads leading to and from the station with some onward movements on the strategic network. Although a relatively low number of vehicles, as routes are close to capacity, there are impacts but limited mainly to the area around the scheme and on connections to the A40.
- 6.7.287 The Proposed Scheme is expected to result in increases in peak hour traffic flows of more than 10% in 2026 on the road network near to Old Oak Common Station causing an increase in traffic-related severance for non-motorised users in the locations set out in Table 6-266.

Table 6-266: Summary of impacted links CFA4-6 2026 Operation (AM & PM 2-way average)

2026 Operation		Increase in General Traffic		Increase in HGVs	
		PCU	%	PCU	%
CFA	Roads impacted by increase				
3	Adelaide Road	N/A	N/A	20	19%
4	Du Cane Road	163	24%	69	63%

2026 Operation		Increase in General Traffic		Increase in HGVs	
CFA	Roads impacted by increase	PCU	%	PCU	%
4	Barlby Road	N/A	N/A	11	13%
4	Cambridge Gardens	N/A	N/A	12	13%
4	Chase Road	N/A	N/A	8	10%
4	Old Oak Lane	N/A	N/A	122	130%
4	OOC Lane	N/A	N/A	88	122%
4	Shepherd's Bush Road	N/A	N/A	22	12%
4	Victoria Road	168	10%	N/A	N/A
4	St Marks Road	N/A	N/A	12	23%
4	Westbourne Park Road	N/A	N/A	12	13%
4	Westway onslip (Westbound, Wood Lane)	N/A	N/A	21	39%
4	Wood Lane	N/A	N/A	24	49%
5	Welland Gardens	59	11%	N/A	N/A

- 6.7.288 As well as impacts from the Old Oak Common Station there are in some cases very limited marginal impacts arising from Euston that are considered in reporting of effects.
- 6.7.289 While the plots suggest that Old Oak Common Lane to the south of the station will experience an overall reduction in flow, there is a substantial increase in the percentage of heavy vehicles due to the additional buses serving the route (ie increasing from 12 to 34 buses per hour in each direction as previously explained).
- 6.7.290 The results of the highway assignment for the 2041 Operational scenario AM and PM peak hour are tabulated in Table 6-267 and Table 6-268, with the results for CFA5 and CFA6 shown for comparison.

Table 6-267: WELHAM highway assignment CFA4-6 2041 AM Operation

WeLHAM AM Flows (Vehicles)	Direction	Future Baseline 2041		2041 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
CFA4									
Kilburn High Road (south of Belsize Road)	NB	666	68	666	69	0	1	0%	1%
	SB	201	47	203	48	2	0	1%	0%
Salisbury Road (north of Premier Corner)	NB	525	10	519	10	-6	0	-1%	-1%
	SB	481	11	495	11	15	0	3%	2%
Premier Corner (north of Kilburn Lane)	NB	1,009	58	996	58	-13	0	-1%	-1%
Chamberlayne Road (north of Kilburn Lane)	NB	396	64	400	64	4	0	1%	0%
	SB	489	79	495	79	6	1	1%	1%
Harrow Road (west of College Road)	WB	454	25	451	26	-3	1	-1%	3%
	EB	381	44	392	44	11	0	3%	0%
Scrubs Lane (north of Hythe Road)	NB	434	37	467	37	33	0	8%	1%
	SB	804	60	849	61	45	1	6%	1%
Old Oak Common Lane (north of Wulfstan Street)	NB	248	26	181	43	-67	17	-27%	64%
	SB	485	34	340	47	-145	13	-30%	38%
Old Oak Common Lane (south of Du Cane Road)	NB	592	38	630	29	38	-8	6%	-22%
	SB	354	36	358	30	4	-7	1%	-18%
Wales Farm Road	SB	1,200	140	1,290	146	90	6	7%	4%
Victoria Road (north of Park Royal Road)	NB	1,172	117	1,206	120	33	4	3%	3%
Park Royal Road	NB	456	39	471	40	15	0	3%	1%
	SB	349	62	356	63	7	1	2%	1%

WeLHAM AM Flows (Vehicles)	Direction	Future Baseline 2041		2041 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
CFA5									
Coronation Road	EB	255	15	257	15	1	0	0%	0%
	WB	36	10	36	10	0	0	0%	0%
Connell Crescent bridge	EB	399	8	399	8	-1	0	0%	0%
	WB	15	0	13	0	-2	0	-12%	0%
Hanger Lane East Bridge	SB	5,181	304	5,219	305	38	2	1%	1%
Hanger Lane West Bridge	NB	4,785	241	4,809	242	25	1	1%	0%
Alperton Lane	NB	532	1	531	1	-2	0	0%	-1%
	SB	422	38	417	38	-5	-1	-1%	-1%
Bideford Avenue	NB	331	10	323	10	-8	0	-2%	-1%
	SB	443	26	440	26	-3	0	-1%	0%
Horsenden Lane	NB	244	8	242	8	-1	0	0%	0%
	SB	260	24	259	24	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	446	16	439	16	-7	0	-2%	0%
	SB	563	9	569	9	5	0	1%	-1%
Greenford Road (south of Uneeda Drive)	NB	857	80	856	80	-1	1	0%	1%
	SB	867	65	872	65	5	0	1%	0%
Oldfield Lane (north of Uneeda Drive)	NB	402	20	422	20	19	0	5%	0%
	SB	660	24	660	24	0	0	0%	1%
Mandeville Road (north of Eastcote Lane)	NB	1,268	41	1,264	41	-4	0	0%	0%
	SB	843	35	842	35	-1	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1,226	58	1,221	58	-4	0	0%	0%
	SB	1,017	52	1,014	52	-3	0	0%	0%
Eastcote Lane	EB	666	13	665	13	-1	0	0%	-1%
	WB	358	12	359	12	1	0	0%	0%

WeLHAM AM Flows (Vehicles)	Direction	Future Baseline 2041		2041 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
CFA6									
West End Road	NB	686	29	685	29	-1	-1	0%	-2%
	SB	498	22	494	22	-3	0	-1%	2%
Ickenham Road	NB	823	27	822	27	-1	0	0%	0%
	SB	1,183	71	1,182	70	-2	-1	0%	-2%
Breakspear Road	NB	516	14	515	14	-1	0	0%	-1%
	SB	701	19	694	19	-6	0	-1%	0%
Harvil Road	NB	340	19	341	19	1	0	0%	0%
	SB	466	17	469	18	3	0	1%	1%
Swakeleys Road (south)	NB	1,689	88	1,685	88	-4	0	0%	0%
	SB	1,649	119	1,643	118	-5	-1	0%	-1%

Table 6-268: WELHAM highway assignment CFA4-6 2041 PM Operation

WELHAM Screenline Analysis	Direction	Future Baseline 2041		2041 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
WelHAM PM Flows (Vehicles)									
CFA4									
Kilburn High Road (south of Belsize Road)	NB	613	58	618	57	5	0	1%	0%
	SB	328	46	330	46	3	0	1%	0%
Salisbury Road (north of Premier Corner)	NB	544	7	555	7	10	0	2%	2%
	SB	406	11	407	11	1	0	0%	1%
Premier Corner (north of Kilburn Lane)	NB	1,005	37	1,009	37	4	0	0%	0%
Chamberlayne Road (north of Kilburn Lane)	NB	664	67	667	67	3	0	1%	-1%
	SB	499	50	501	50	2	0	0%	0%

WELHAM Screenline Analysis	Direction	Future Baseline 2041		2041 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
WeLHAM PM Flows (Vehicles)	WB	579	28	586	28	7	0	1%	1%
	EB	470	22	463	22	-6	0	-1%	0%
Scrubs Lane (north of Hythe Road)	NB	1,008	40	1,007	39	-1	-1	0%	-2%
	SB	506	28	534	28	28	0	5%	1%
Old Oak Common Lane (north of Wulfstan Street)	NB	424	33	424	56	0	23	0%	70%
	SB	214	15	157	40	-57	25	-27%	169%
Old Oak Common Lane (south of Du Cane Road)	NB	328	26	364	23	36	-3	11%	-13%
	SB	458	25	467	25	9	-1	2%	-3%
Wales Farm Road	SB	1,364	60	1,500	60	136	0	10%	0%
Victoria Road (north of Park Royal Road)	NB	901	47	941	46	40	0	4%	0%
Park Royal Road	NB	397	45	425	47	28	2	7%	5%
	SB	434	24	436	24	2	0	1%	0%
CFA5									
Coronation Road	EB	136	12	162	12	26	0	19%	0%
	WB	67	10	67	10	0	0	0%	0%
Connell Crescent bridge	EB	147	5	173	5	26	0	17%	0%
	WB	47	0	47	0	0	0	0%	
Hanger Lane East Bridge	SB	4,867	146	4,936	145	69	-1	1%	-1%
Hanger Lane West Bridge	NB	5,074	145	5,125	147	51	1	1%	1%
Alperton Lane	NB	424	0	425	0	1	0	0%	3%
	SB	353	2	359	2	6	0	2%	2%
Bideford Avenue	NB	240	9	240	8	-1	-1	0%	-12%
	SB	691	24	686	24	-5	0	-1%	0%
Horsenden Lane	NB	334	14	328	14	-6	0	-2%	-2%
	SB	299	8	299	8	0	0	0%	4%
Greenford Road (north of Uneeda Drive)	NB	553	3	550	2	-3	0	-1%	-8%
	SB	508	3	509	2	1	0	0%	-5%

WELHAM Screenline Analysis	Direction	Future Baseline 2041		2041 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
Greenford Road (south of Uneeda Drive)	NB	1,021	37	1,025	37	4	0	0%	0%
	SB	962	40	963	39	1	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	641	17	646	17	5	0	1%	1%
	SB	495	13	496	13	1	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1,166	26	1,166	26	0	0	0%	0%
	SB	827	20	826	20	0	0	0%	1%
Mandeville Road (south of Eastcote Lane)	NB	1,447	35	1,450	35	2	0	0%	1%
	SB	515	32	516	32	1	0	0%	1%
Eastcote Lane	EB	645	8	648	8	3	0	0%	0%
	WB	527	11	529	11	2	0	0%	0%
CFA6									
West End Road	NB	898	10	897	10	-1	0	0%	0%
	SB	620	10	620	10	0	0	0%	0%
Ickenham Road	NB	1,125	24	1,128	24	2	0	0%	0%
	SB	949	22	948	22	0	0	0%	0%
Breakspear Road	NB	750	9	745	9	-4	0	-1%	0%
	SB	601	12	602	12	1	0	0%	0%
Harvil Road	NB	460	16	461	16	2	0	0%	0%
	SB	488	9	486	9	-1	0	0%	0%
Swakeleys Road (south)	NB	1,509	135	1,507	135	-1	0	0%	0%
	SB	1,457	77	1,456	77	-1	0	0%	0%

6.7.291 The results of the highway assignment for the 2041 Operational scenario AM and PM periods are illustrated in Figure 6-204 and Figure 6-205 below.

Figure 6-204: Difference in Demand Flows: 2026 with Hs2 operation v/c 2041 Baseline AM period (pcu's).

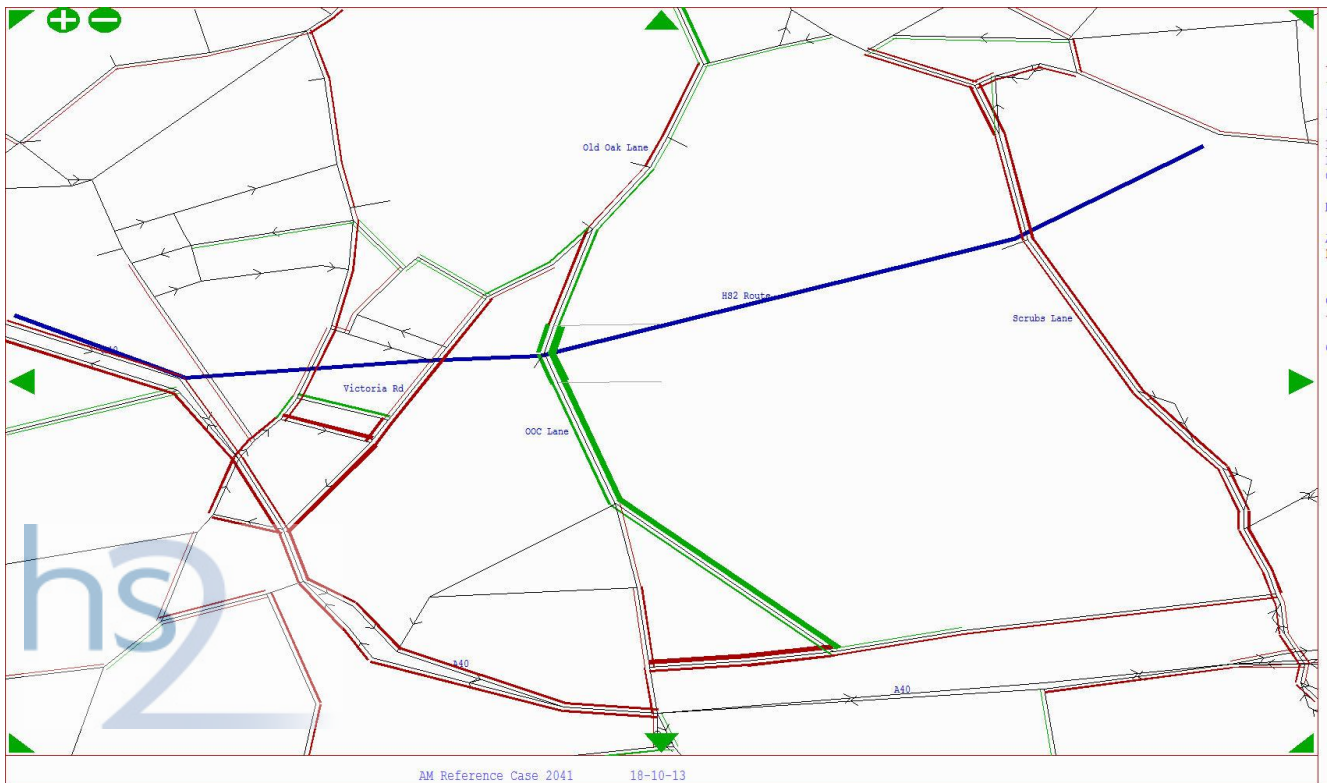
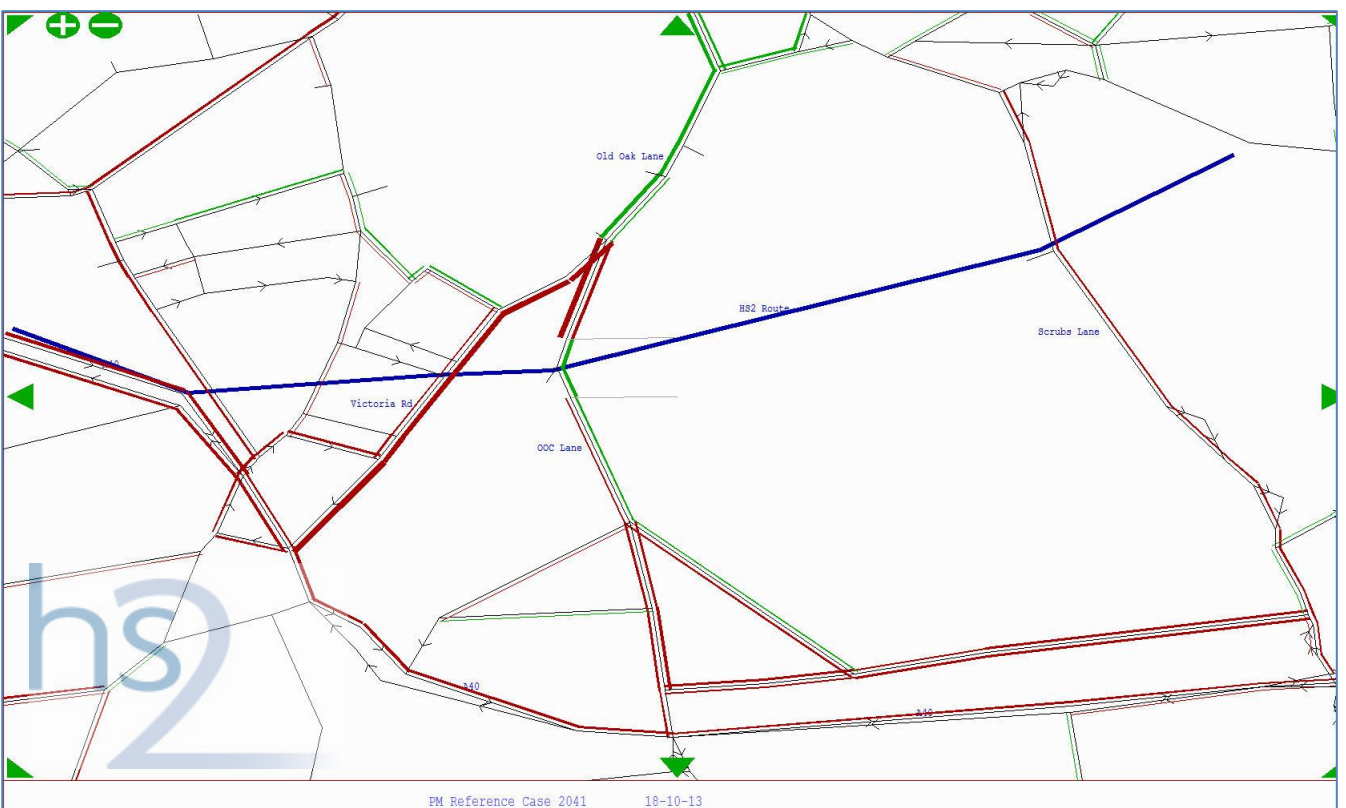


Figure 6-205: Difference in Demand Flows: 2026 with Hs2 operation v/c 2041 Baseline PM period.



6.7.292 The plots above in Figure 6-204 and Figure 6-205 show that increases in traffic as a result of the Proposed Scheme in 2041 are almost entirely access trips to and from Old Oak Common station. Although occasional traffic may access areas of the Proposed Scheme for maintenance and servicing purposes, these infrequent vehicle movements that will be very low.

- 6.7.293 In 2041, the impact of traffic accessing Old Oak Common station is primarily on local roads leading to and from the station with some onward movements on the strategic network. Due to the relatively low number of vehicle movements on routes that are close to capacity, there are few impacts.
- 6.7.294 As a result of the above assignment, the Proposed Scheme is expected to result in increases in average peak hour traffic flows of more than 10% in 2041 on the road network local to Old Oak Common Station, potentially causing an increase in traffic impacts for non-motorised users in the location tabulated in Table 6-26g below.

Table 6-26g: Summary of impacted links CFA4-6 2041 Operation (AM & PM 2-way average)

2041 Operation		Increase in General Traffic		Increase in HGVs	
CFA	Roads impacted by increase	PCU	%	PCU	%
1	B525 Avenue Road	*	*	19	51%
1	Prince Albert Road	*	*	20	13%
3	B525 Avenue Road	*	*	19	49%
4	Barlby Road	*	*	11	11%
4	Cambridge Gardens	*	*	12	13%
4	Chase Road	*	*	9	12%
4	Du Cane Road	164	24%	69	62%
4	East Churchfield Road	*	*	6	33%
4	OOC Lane	*	*	85	113%
4	Old Oak Lane	*	*	118	121%
4	Shepherd's Bush Road	*	*	21	11%
4	St Marks Road	*	*	11	20%
4	Victoria Road	227	12%	*	*
4	Wales Farm Road	273	15%	*	*
4	Westbourne Park Road	*	*	12	13%
4	Westway offslip (Wood Lane)	*	*	0	38%
4	Wood Lane (north of A40)	*	*	55	27%
4	Wood Lane (south of A40)	*	*	23	43%
5	Friary Road	*	*	6	33%
5	Friary Way	*	*	5	45%
5	St Dunstan's Avenue	*	*	5	45%

- 6.7.295 As for 2026, whilst the plots suggest that Old Oak Common Lane to the south of the station will experience an overall reduction in flow, there is a substantial increase in the percentage of heavy

vehicles due to the additional buses serving the route (ie increasing from 12 to 34 buses per hour in each direction as previously explained).

6.7.296 As can be seen the Proposed Scheme is expected to result in further impacts in terms of increases in peak hour traffic flows in 2041 over those identified in 2026 causing an increase in potential traffic-related severance for non-motorised users in the following additional locations:

- East Churchfield Road; and
- A4000 Wales Farm Road.

Junction performance in 2026 & 2041.

6.7.297 The operation of the junctions was analysed for 2026 and 2041 as set out in the tabulations below. It should be noted that whilst there may be increases in the degree of saturation on any one arm, once the changes in all arms are considered, the changes in overall junction saturation will be typically much lower.

6.7.298 The assessment trigger of a 2% increase at a junction already operating at or above 87% saturation with the Proposed Scheme, will often be reduced once the signal timings at a junction are re-optimised. However at this stage no re-optimisation has been undertaken at any junctions other than a preliminary analysis for the main Old Oak Common Lane /Victoria Road junction. The following assessments and discussion consider the key local junctions..

Salisbury Road / Carlton Vale / Fernhead Road

6.7.299 Table 6-270 shows the changes in flows at this junction. Salisbury Road carries the highest traffic flow in both the AM and PM peak. However the modelling indicates that the junction operates within capacity under all operational scenarios, with effectively no incremental increase with the Proposed Scheme.

Table 6-270: CFA4-6 2026 & 2041 Junction Operation Salisbury Road/Carlton Vale.

	2026 AM baseline			2026 AM Reference + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
Salisbury Road / Carlton Vale / Fernhead Road	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Salisbury Road	1,033	18	0	1,034	18	0	1,049	19	0	1057	19	0
Carlton Vale	376	9	0	379	9	0	416	10	0	403	10	0
Fernhead Road	305	39	0	308	40	0	309	41	0	305	40	0
Kilburn Lane* (1 way out)	*	*	*	*	*	*	*	*	*	*	*	*
	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
Salisbury Road	810	15	0	807	15	0	871	16	0	864	16	0

Carlton Vale	473	12	0	469	12	0	468	12	0	476	12	0
Fernhead Road	359	47	0	371	48	0	351	46	0	357	47	0
Kilburn Lane* (1 way out)	*	*	*	*	*	*	*	*	*	*	*	*

Premier Corner / Kilburn Lane

6.7.300 Table 6-271 shows the changes in flows at this junction. Kilburn Lane carries the highest traffic flow in both the AM and PM peak. The modelling indicates that the junction operates within capacity under all operational scenarios, there is the potential for blocking back through the links within the gyratory, to some extent dependent on pedestrian crossing demands. There will be effectively no incremental increase with the Proposed Scheme.

Table 6-271: CFA4-6 2026 & 2041 Junction Operation Premier Corner /Kilburn Lane

	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
Premier Corner / Kilburn Lane	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Premier Corner* (1 way out)	*	*	*	*	*	*	*	*	*	*	*	*
Kilburn Lane (WB)	818	14	0	825	14	0	863	15	0	849	15	0
Kilburn Lane (EB)	366	39	0	373	39	0	374	39	0	369	39	0
	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
Premier Corner* (1 way out)	*	*	*	*	*	*	*	*	*	*	*	*
Kilburn Lane (WB)	941	16	0	947	16	0	931	16	0	943	16	0
Kilburn Lane (EB)	376	35	0	372	35	0	395	36	0	392	37	0

Salisbury Road / Brondesbury Road / Harvist Road

6.7.301 Table 6-272 shows the changes in flows at this junction. Salisbury Road northbound carries the highest traffic flow in both the AM and PM peak. The modelling indicates that the junction operates within capacity under all operational scenarios, with the AM period experiencing slightly higher levels of saturation (at 60% saturation). There will be effectively no incremental increase with the Proposed Scheme either in degree of saturation or queues.

Table 6-272: CFA4-6 2026 & 2041 Junction Operation Salusbury Road/Harvist Road

	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
Salusbury Road / Brondesbury Road / Harvist Road	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Salusbury Road (SB)	376	59	7	357	56	6	366	58	6	381	59	7
Brondesbury Road	141	17	3	156	19	3	161	19	3	158	19	3
Salusbury Road (NB)	512	58	9	529	58	9	535	60	9	529	60	9
Harvist Road	205	32	4	194	31	4	209	33	4	210	33	4
	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
Salusbury Road (SB)	340	43	5	339	43	5	364	46	5	363	46	5
Brondesbury Road	115	19	2	114	19	2	117	19	2	116	19	2
Salusbury Road (NB)	551	43	9	564	43	9	552	45	9	562	46	9
Salusbury Road (NB)	141	28	3	138	27	3	173	34	3	170	34	3

Old Oak Common Lane / Du Cane Road

6.7.302 Table 6-273 shows the changes in flows at this junction. Old Oak Common Lane northbound carries the highest traffic flow in both the AM and PM peak in the baseline periods, but with OOC Lane southbound experiencing the highest levels of saturation. There is a 1% saturation change in the AM peak period with HS2, but a maximum 6 % increase in the PM period 2026, and 7% increase in 2041. However queue lengths remain virtually unaffected. These increases are likely to be due to a combination of some additional traffic accessing the station routing via the junction and diversionary impacts.

Table 6-273: CFA4-6 2026 & 2041 Junction Operation Old Oak common /Du Cane Road

	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
Old Oak Common Lane / Du Cane Road	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Old Oak Common Lane (SB)	179	92	4	206	94	5	181	93	4	208	95	5
Du Cane Road	171	33	3	230	43	4	184	34	4	240	44	5
Old Oak Common Lane (NB)	623	57	9	653	59	9	629	57	9	659	59	9

Old Oak Common Lane / Du Cane Road	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
Old Oak Common Lane (SB)	354	78	5	404	84	5	363	81	5	421	88	5
Du Cane Road	189	62	4	215	77	5	194	63	4	217	77	5
Old Oak Common Lane (NB)	357	34	4	354	34	4	384	37	5	387	37	5

Old Oak Common Lane / Western Avenue / Old Oak Road

6.7.303 Table 6-274 shows the changes in flows at this junction. Western Avenue carries by far the highest flows at the Old Oak Common Lane junction and experiences the highest level of saturation. Flow changes with the scheme are minimal. There is a minimal change in degree of saturation and queues in with the Proposed scheme. These increases are likely to be due to a combination of some additional traffic accessing the station routing via the junction and diversionary impacts.

Table 6-274: CFA4-6 2026 & 2041 Junction Operation Old Oak Common Lane/Western Avenue

Old Oak Common Lane / Western Avenue / Old Oak Road	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Old Oak Common Lane (SB)	376	77	8	377	78	8	391	80	8	388	80	8
A40 West Way	2,363	81	39	2,388	82	40	2,567	88	42	2,573	88	42
Old Oak Road	*	*	*	*	*	*	*	*	*	*	*	*
Old Oak Common Lane (NB)	1,560	63	18	1,569	63	18	1,575	63	18	1,587	63	18
A40 Western Avenue (EB)	3,452	103	43	3,499	103	43	3,494	103	43	3,551	103	43
	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
Old Oak Common Lane (SB)	465	94	10	473	96	10	483	98	10	492	100	10
A40 West Way	2,499	99	44	2,506	99	44	2,537	100	44	2,533	99	44

Old Oak Common Lane / Western Avenue / Old Oak Road	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Old Oak Road	*	*	*	*	*	*	*	*	*	*	*	*
Old Oak Common Lane (NB)	1,533	61	16	1,537	61	16	1,561	61	16	1,562	61	16
A40 Western Avenue (EB)	3,145	91	41	3,195	92	41	3,229	92	41	3,290	94	42

Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road

6.7.304 Table 6-275 shows the changes in flows at this junction. Victoria Road and Old Oak Lane carries the highest flows at the Old Oak Common Lane junction, and experience the highest levels of saturation. Flow changes with the scheme on the Old Oak common Lane arm increase by up to 29 percent, and the degree of saturation on this arm also increases substantially 42 to 77 percent in the PM peak. With detailed re-optimisation this would be expected to be substantially lower. These increases are likely to be due to a combination of traffic accessing the station routing via the junction and diversionary impacts.

Table 6-275: CFA4-6 2026 & 2041 Junction Operation Atlas Road/ Old Oak Common

Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Atlas Road	54	25	1	54	18	1	56	26	1	56	19	1
Old Oak Lane (SB)	638	39	7	608	70	13	696	42	8	664	76	14
Old Oak Common Lane (NB)	288	61	5	324	59	8	296	63	5	338	66	8
Victoria Road (NB)	638	55	7	610	81	12	700	62	8	674	89	13
Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Atlas Road	147	68	3	147	37	3	153	71	3	153	43	3
Old Oak Lane (SB)	660	40	7	640	73	16	705	42	8	681	77	17
Old Oak Common Lane (NB)	421	93	7	504	71	11	439	97	8	558	81	12
Victoria Road (NB)	441	28	5	442	81	11	483	31	5	486	90	12

Bethune Road / Victoria Road

- 6.7.305 Table 6-276 shows the changes in flows at this junction. Victoria Road carries the main flow to and from the A40. Bethune Road is a small side road. Access onto Victoria Road will in fact be closed off as part of the scheme but the assessment helps to illustrate the volume of traffic that would be expected to transfer to use School Road junction with operation of the Proposed scheme. At under 30 vehicles per hour this is a negligible impact.

Table 6-276: CFA4-6 2026 & 2041 Junction Operation Bethune Road /Victoria Road

	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
Bethune Road / Victoria Road	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Bethune Road	26	8	0	26	19	1	76	24	1	26	19	1
Victoria Road (SB)	413	32	2	454	35	5	449	34	3	508	39	5
Victoria Road (NB)	506	47	3	518	46	5	509	47	3	577	51	6
	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
Bethune Road	26	8	0	26	25	1	26	8	0	26	25	1
Victoria Road (SB)	605	46	4	671	46	7	672	50	4	786	55	8
Victoria Road (NB)	265	25	2	303	25	3	302	28	2	337	27	3

Western Avenue / A4000 Wales Farm Road

- 6.7.306 Table 6-277 shows the changes in flows at this junction. The Wales Farm Road /Western Avenue node forms part of the Gypsy Corner junction. Again flows are dominated by the Western Avenue arms. In terms of the RFC the incremental impact of the scheme is 6% on an approach arm, but under 2 % overall.

Table 6-277: CFA4-6 2026 & 2041 Junction Operation Western Avenue/Wales Farm Road

	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
Western Avenue / A4000 Wales Farm Road	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Western Avenue (EB)	3273	99	40	3295	100	39	3311	100	40	3337	100	39
Wales Farm Road	1259	44	23	1340	46	24	1340	46	24	1436	49	26

Wesrn Avenue (WB)	2673	68	32	2714	69	32	2765	70	33	2805	71	33
A4000	*	*	*	*	*	*	*	*	*	*	*	*
	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
Western Avenue (EB)	2910	79	28	2933	79	28	2984	80	28	3015	81	29
Wales Farm Road	1317	54	30	1411	58	32	1424	58	32	1560	64	35
Western Avenue (WB)	3060	68	36	3068	68	36	3103	68	36	3100	68	36
A4000	*	*	*	*	*	*	*	*	*	*	*	*

Friary Road / Horn Lane

6.7.307 Table 6-278 shows the changes in flows at this junction. Horn Lane carries the highest flows at this junction. It is noted that this forms a potential cut through to avoid queuing as part of the Gypsy Corner junction, and thus flows in the peak hours are likely to be quite variable.

6.7.308 Horn Lane southbound experiences the highest level of saturation, with a maximum 9% change on the Friary Road (WB) arm, and with an average of just over 2% change on all arms. Queue lengths are effectively unchanged.

Table 6-278: CFA4-6 2026 & 2041 Junction Operation Friary Road/Horn Lane junction

	2026 AM baseline			2026 AM baseline + HS2 Op			2041 AM baseline			2041 AM baseline + HS2 Op		
Friary Road / Horn Lane	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Horn Lane (SB)	691	89	9	718	92	9	701	90	9	727	93	9
Friary Road (WB)	144	34	3	182	43	4	157	37	3	196	46	4
Horn Lane (NB)	763	89	10	759	90	10	763	90	10	763	91	10
	2026 PM baseline			2026 PM baseline + HS2 Op			2041 PM baseline			2041 PM baseline + HS2 Op		
Horn Lane (SB)	384	95	4	391	96	4	383	94	4	389	95	4
Friary Road (WB)	323	75	4	336	77	5	326	75	4	333	77	4
Horn Lane (NB)	487	85	6	497	87	6	486	84	6	494	86	6

6.7.309 The permanent closure of Bethune Road will have a limited and very localised impact as existing uses on Bethune Road will be replaced by the crossover box, and a new link will be provided as a westwards extension of School Road onto Chase Road.

Impact on parking 2026 & 2041

6.7.310 It is envisaged that there will be a loss of up to 15 of the 40 (38%) car parking spaces at Salusbury Road car park during the operational phase. These spaces will be used for maintenance access.

Impact on accidents and safety 2026 & 2041

- 6.7.311 The impact on accidents and safety risk is nominal as there are no locations where there are existing highway safety issues, and the highway improvements and improve layouts will mitigate impacts from additional traffic. It is expected that the improvements to the highway network and provisions for pedestrians and cyclists included in the Proposed Scheme would be likely to offset any impacts of increased traffic.

Impact on pedestrians 2026 & 2041

- 6.7.312 The Salusbury Road footway lost during construction would be reinstated. The Proposed Scheme would have minimal impact on the Wells House Road PRow.
- 6.7.313 At Old Oak Common the Proposed Scheme would incorporate dedicated pedestrian and cycle facilities and upgrade facilities along Old Oak Common Lane.
- 6.7.314 Bethune Road will be permanently stopped up and incorporated into the Permanent Scheme with a minor impact for non-motorised users due to increased travel distances.

6.8 Northolt Corridor (CFA5)

Northolt Corridor (CFA5) Proposed Scheme description

- 6.8.1 This section describes the main features of the Proposed Scheme in the Northolt Corridor area (CFA5).
- 6.8.2 CFA5 is in West London and covers the London Boroughs of Brent and Ealing, with all works being within Ealing. CFA4 (Kilburn (Brent) to Old Oak Common) lies to the east, and CFA6 (South Ruislip and Ickenham) to the west.
- 6.8.3 The Northolt Tunnel is approximately 13.4km in overall length between Old Oak Common station and the West Ruislip portal, of which 8.6km lies within CFA5. The tunnel will start at the western end of the Victoria Road crossover box (located in CFA4) and after approximately 300m, will enter CFA5 beneath the B4492 Park Royal Road. The Northolt Tunnel will then proceed west, before terminating at the West Ruislip portal (located in CFA6) (see Maps CT-06-009 to CT-06-0015 (Volume 2, CFA5 Map Book)). The Northolt Tunnels will have:
- Two running tunnels each of approximately internal diameter of 8.8m;
 - a rail depth below ground level varying between approximately 23m and 42m; and
 - cross passages between running tunnels at approximately 380m intervals
 - 3 intervention and ventilation shafts.
- 6.8.4 Through this area the proposed HS2 route will be approximately 8.7km in length and will comprise the twin-bore Northolt Tunnel. The route will commence from the boundary with Kilburn (Brent) to Old Oak Common (CFA4) at B4492 Park Royal Road, west of Acton Cemetery. The route will then continue north-west, connecting with three new ventilation and intervention shafts. The route will leave the CFA at a point to the south of Rabournmead Drive on the boundary between the London Boroughs of Ealing and Hillingdon.
- 6.8.5 CFA5 does not contain any HS2 stations and the line is in tunnel (served by worksites in other CFAs) and so does not require any works to intersecting roads, railways, PRoWs or waterways. The only surface interventions are three shaft sites.
- 6.8.6 The locations of these vent shaft sites have been chosen to minimise the impact of construction. The works at each site generates a relatively small flow of traffic, and their proximity to the main road network means that the traffic impact is negligible. Aside from minor issues such as the possible need for footway narrowing at sites, the construction will not require any closures or diversions.
- 6.8.7 The vent shaft sites will be used for operation purposes, but this will be limited to occasional relatively minor maintenance activities. The operational impact on the transport network will therefore be negligible and so has not been explicitly assessed.
- 6.8.8 In general, features are described from south to north along the route (and east to west for features that cross HS2). The area covered by CFA5 is illustrated in Figure 6-206 to Figure 6-208 that also shows the location of the CFA5 sites relative to the strategic road network including the connections from each of the sites to the strategic network.

- 6.8.9 It can be seen that worksites within CFA5 are generally located parallel to, and to the north of, the Western Avenue (A40). The A40 is on the TLRN. It extends from Westminster in Central London and becomes the M40 to the west, connecting to the M25 and other destinations to the north.
- 6.8.10 Below is a brief description of each site, including its location in relation to the Strategic Road Network. Since the HS2 route is in bored tunnel through this area no roads, bus routes or PRowS are diverted or affected by the operational scheme.

Northolt Tunnel

- 6.8.11 The Northolt Tunnel is approximately 13.4km in overall length between Old Oak Common station and the West Ruislip portal, of which 8.7km lies within CFA5. The tunnel will start at the western end of the Victoria Road Crossover Box (located in CFA4) and, after approximately 300m, will enter CFA5 beneath the B4492 Park Royal Road. The Northolt Tunnel will then continue west, before terminating at the West Ruislip Portal (located in CFA6) (see Maps CT-06-009 to CT-06-0015).

Westgate Shaft

- 6.8.12 The proposed shaft at Westgate will be located approximately 180m west of Hanger Lane and directly south of Westgate, within the site of an existing builders' merchant (see Map CT-06-011). The shaft will have an area of hard standing to the north, east and west of the headhouse to provide access for maintenance and for the emergency services; and will be accessed from Westgate.
- 6.8.13 Construction of this section will be managed from the Westgate Shaft Main Site Compound. West Gate connects the commercial West Gate Business Park area to the west of Hanger Lane with the A40, permitting access onto the A40 eastbound only.

Greenpark Way Shaft

- 6.8.14 The proposed shaft at Greenpark Way will be located on vacant land within an existing business park, east of the A4127 Greenford Road on the northern side of the London Underground Central line (see Map CT-06-013). The shaft will have an area of hard standing around both the headhouse and express feeder auto-transformer station to provide access for maintenance and the emergency services, and it will be accessed from Rockware Avenue.
- 6.8.15 Construction of this section will be managed from the Greenpark Way Shaft Main Site Compound. The compound is connected to the A4127 Greenford Road to the west via Greenpark Way to the north of the site and Rockware Avenue to the south of the site. Greenford Road connects to the Western Avenue (A40) to the south.
- 6.8.16 Greenford Road is a main borough distributor road, commencing from the Uxbridge Road approximately 4km south of the site, and carries traffic in a north / south direction to the A4005 Harrow Road approximately 2.5km to the north of the site.

Figure 6-206: CFA4/5 Wider area core road network, compounds & construction routes (CFA5 East)

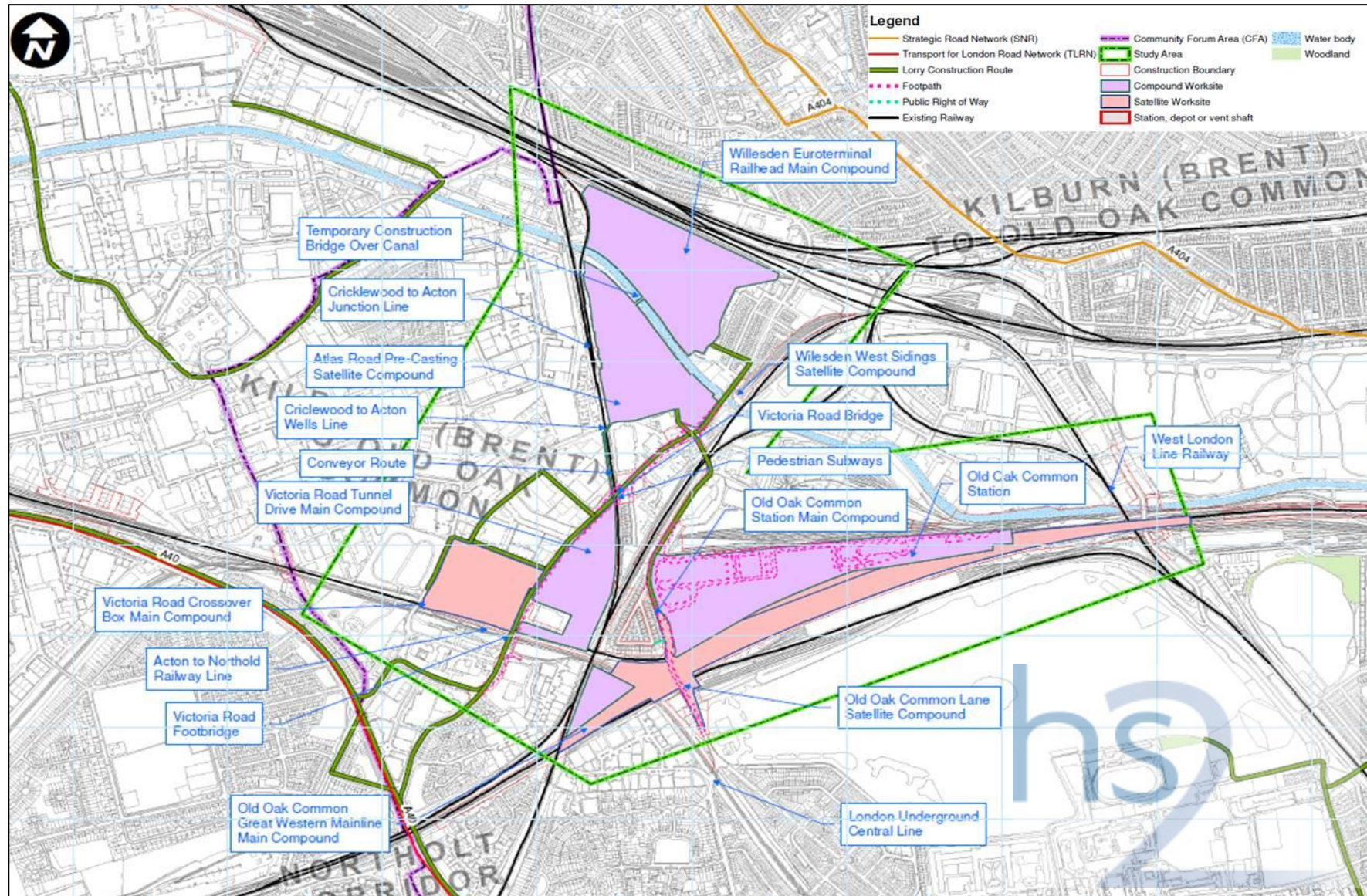


Figure 6-207: CFA5 Wider area core road network, compounds & construction routes (CFA5 Centre)

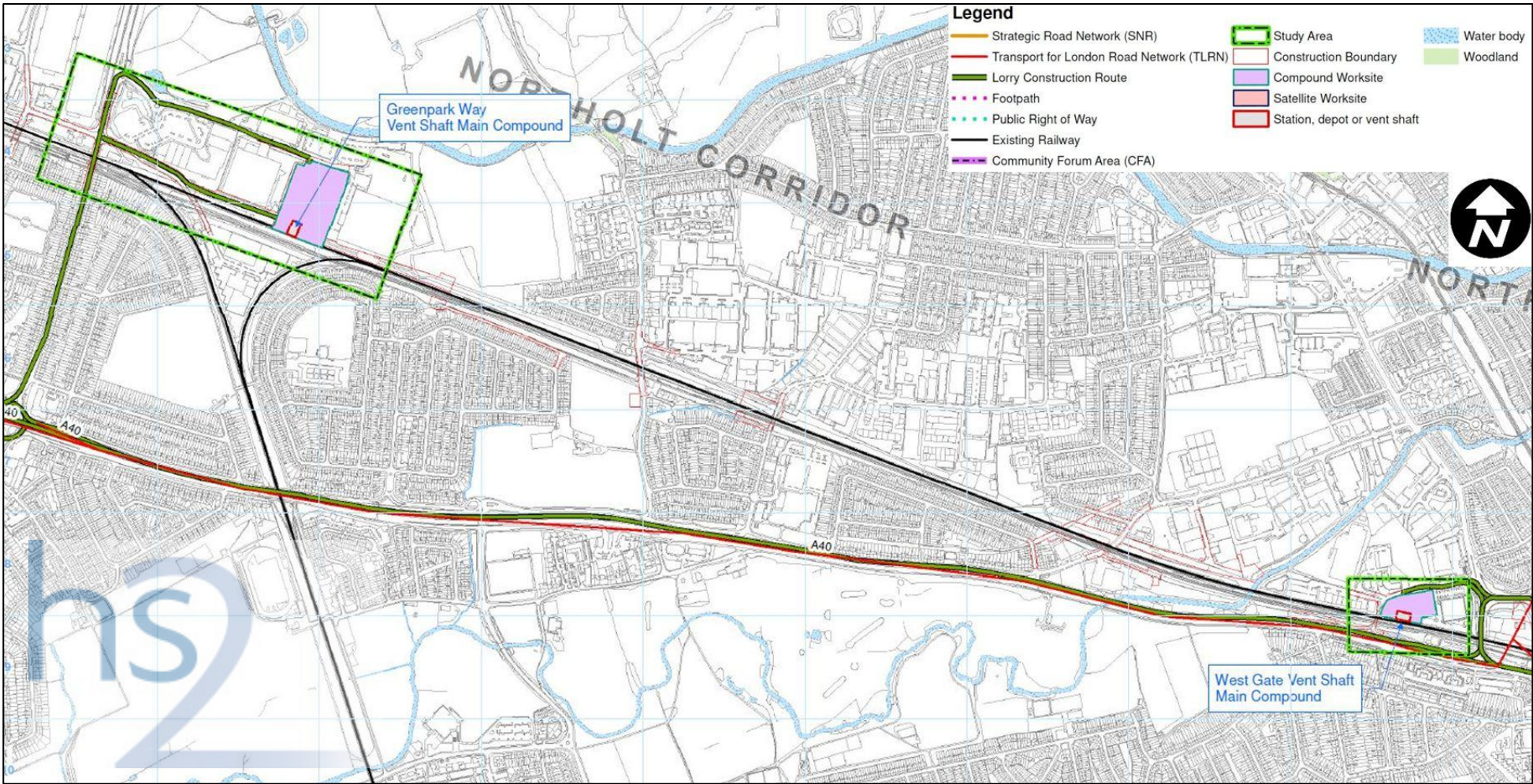
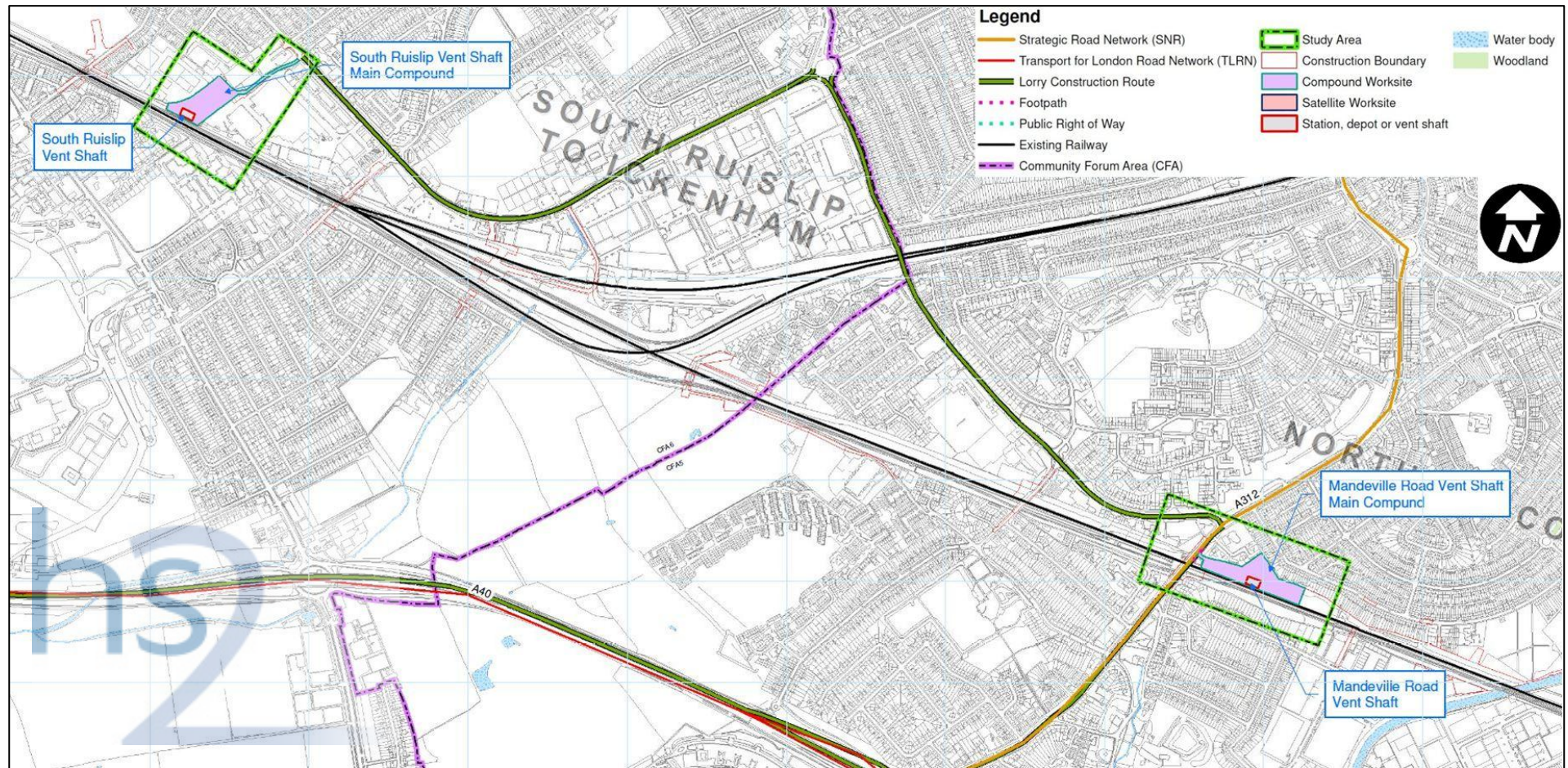


Figure 6-208: CFA5 Wider area core road network, compounds & construction routes (CFA5 west)



Mandeville Road Shaft

- 6.8.17 The proposed shaft at Mandeville Road will be located on an existing railway cutting slope approximately 150m east of the A312 Mandeville Road, on the northern side of the London Underground Central line (Map CT-06-014). The shaft will have an area of hard standing to the north of the headhouse to provide access for maintenance and the emergency services; and it will be accessed from Mandeville Road.
- 6.8.18 Construction of this section will be managed from the Mandeville Road Shaft Main Site Compound. The Mandeville Road (A312) compound site is located to the north east of the existing railway overbridge.
- 6.8.19 Mandeville Road is a subject to a 30 mph speed limit. A northbound bus lane commences immediately north of the junction with Eastcote Lane North and continues over the railway bridge to terminate approximately 80m in advance of the Mandeville Road junction with Eastcote Lane.
- 6.8.20 Eastcote Lane North is located just to the north of the worksite site. It is subject to a 30 mph speed limit. Badminton Close is a residential cul-de-sac with on-street parking located to the immediate north of the site compound.

Northolt Corridor (CFA5) assessment methodology

- 6.8.21 The regional assessment methodology is set out above. There is no departure from that methodology in the assessment for this CFA.
- 6.8.22 The junction and link assessment methodology set out in CFA4 is applicable to this CFA.

Northolt Corridor (CFA5) future baseline

- 6.8.23 The future baseline demand has been developed within the WeLHAM model analysis, taking account of forecasts for changes to population, employment and traffic growth. This includes committed and likely developments in the area covered by the WeLHAM model.
- 6.8.24 No significant changes are expected to affect the highway network; the strategic or local rail network; local bus / coach services; or to public transport interchanges.
- 6.8.25 Individual construction activities have been assessed against 2021 baseline traffic flows, irrespective of when they occur during the construction period. Future baseline traffic volumes in the peak hours are forecast to grow by typically 2.5-3.0% by 2021 compared to 2012.
- 6.8.26 Future baseline traffic volumes in the peak hours are forecast to grow by typically 4.5-5.5% by 2026 compared to 2012.
- 6.8.27 Future baseline traffic volumes in the peak hours are forecast to grow by typically 8.5-9.5% by 2041 compared to 2012.
- 6.8.28 Traffic flows on strategic and local roads are set out in Table 6-279 and Table 6-280 below for Baseline (2012), construction baseline (2021), HS2 Phase 1 operation (2026), and HS2 phase 2 operations (2041). Forecasts for other years may be determined by extrapolation assuming linear growth.

6.8.29 For assessment purposes Heavy Vehicles includes both HGVs and buses, and are represented as numbers of vehicles in the flow tables below. It should be noted that junction assessments below, and graphical outputs from the modelling, are shown in passenger car units (PCUs) as is normal practice. For a typical road where HGVs make up 5% of the traffic flow, 100PCUs would represent 95 vehicles.

6.8.30 It should be noted for these and all subsequent WeLHAM output tables that the model often provides outputs that are not whole numbers, but that these have been rounded to whole numbers for presentation in this report. While such rounding usually results in flow differences of no more than two vehicles, where flows are already very small these can lead to unexpected results as in the following example:

- 2.6 compared to 2.4 is a difference of 0.2, with a percentage difference of 7.7%
- Rounded, the figures would show that 3 compared to 2 is a difference of 1 and a percentage change of 50%

Table 6-279: AM peak hour future baseline traffic flows on key strategic and local roads (demand flows)

		2012 Baseline		2021 Future Baseline		2026 Future Baseline		2041 Future Baseline		All Vehicles change from 2012			All Vehicle % change from 2012		
Location	Direction	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
CFA5															
Coronation Road	EB	239	14	228	14	238	14	255	15	-11	-1	16	-5%	0%	7%
	WB	51	10	33	10	34	10	36	10	-18	-17	-15	-35%	-33%	-30%
Connell Crescent bridge	EB	347	7	345	8	370	8	399	8	-2	23	52	-1%	7%	15%
	WB	15	0	15	0	15	0	15	0	0	0	0	0%	-2%	0%
Hanger Lane East Bridge	SB	5129	299	5034	304	5055	304	5181	304	-95	-74	52	-2%	-1%	1%
Hanger Lane West Bridge	NB	4617	249	4516	236	4639	237	4785	241	-101	22	167	-2%	0%	4%
Alpertown Lane	NB	496	1	548	1	551	1	532	1	52	55	36	10%	11%	7%
	SB	347	37	368	38	382	37	422	38	21	35	75	6%	10%	22%
Bideford Avenue	NB	354	10	309	10	311	10	331	10	-45	-43	-23	-13%	-12%	-6%
	SB	439	27	432	27	422	26	443	26	-8	-17	4	-2%	-4%	1%
Horsenden Lane	NB	246	8	245	8	249	8	244	8	-1	3	-3	-1%	1%	-1%
	SB	260	23	255	23	257	24	260	24	-5	-3	0	-2%	-1%	0%
Greenford Road (north of Uneeda Drive)	NB	417	15	420	16	417	16	446	16	3	-1	29	1%	0%	7%
	SB	554	8	541	8	548	8	563	9	-13	-6	9	-2%	-1%	2%
Greenford Road (south of	NB	834	84	821	86	823	83	857	80	-13	-11	23	-2%	-1%	3%

Location	Direction	2012 Baseline		2021 Future Baseline		2026 Future Baseline		2041 Future Baseline		All Vehicles change from 2012			All Vehicle % change from 2012		
		All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
Uneeda Drive)	SB	862	66	851	65	856	65	867	65	-11	-7	5	-1%	-1%	1%
Oldfield Lane (north of Uneeda Drive)	NB	317	19	316	19	344	19	402	20	-1	27	85	0%	9%	27%
	SB	676	24	633	23	627	24	660	24	-44	-49	-16	-6%	-7%	-2%
Mandeville Road (north of Eastcote Lane)	NB	1253	42	1245	42	1244	41	1268	41	-7	-8	16	-1%	-1%	1%
	SB	838	44	832	35	831	35	843	35	-5	-7	5	-1%	-1%	1%
Mandeville Road (south of Eastcote Lane)	NB	1131	58	1137	60	1166	59	1226	58	7	35	95	1%	3%	8%
	SB	1012	60	1005	51	999	51	1017	52	-8	-13	5	-1%	-1%	1%
Eastcote Lane	EB	659	13	651	13	655	14	666	13	-8	-4	7	-1%	-1%	1%
	WB	322	12	322	12	342	12	358	12	0	20	37	0%	6%	11%

6.8.31 Within CFA5 it can be seen that flow changes are relatively small and these are generally reflected in small percentage changes. Where there are large percentage changes, for example westbound flows on Coronation Road (a 35% decrease from 2012 to 2021), these are still relatively small numbers but on a low base (a reduction of 18 vehicles on a base of 51). The variability in the numbers is a reflection of the modelled impact of congestion.

6.8.32 The highest percentage increases (from 2012 to 2041) are on Oldfield Lane northbound (27% or 85 vehicles per hour) and on Alperston Lane southbound (22% or 75 vehicles per hour).

Table 6-280: PM peak hour future baseline traffic flows on key strategic and local roads (demand flows)

Location	Direction	2012 Baseline		2021 Future Baseline		2026 Future Baseline		2041 Future Baseline		All Vehicles change from 2012			All Vehicle % change from 2012		
		All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
CFA5															
Coronation Road	EB	135	12	123	12	128	11	136	12	-12	-8	1	-9%	-6%	1%
	WB	80	10	62	10	65	10	67	10	-19	-15	-14	-23%	-18%	-17%
Connell Crescent bridge	EB	129	3	135	5	140	3	147	5	6	11	18	5%	8%	14%
	WB	79	0	45	0	45	0	47	0	-34	-33	-32	-43%	-43%	-41%

Location	Direction	2012 Baseline		2021 Future Baseline		2026 Future Baseline		2041 Future Baseline		All Vehicles change from 2012			All Vehicle % change from 2012		
		All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
Hanger Lane East Bridge	SB	4749	146	4648	145	4746	145	4867	146	-101	-3	118	-2%	0%	2%
Hanger Lane West Bridge	NB	4778	142	4667	146	4832	148	5074	145	-111	53	295	-2%	1%	6%
Alperton Lane	NB	369	1	369	0	400	0	424	0	0	32	55	0%	9%	15%
	SB	287	1	286	2	318	2	353	2	-2	30	66	-1%	11%	23%
Bideford Avenue	NB	240	7	232	7	234	8	240	9	-8	-6	1	-3%	-2%	0%
	SB	692	24	687	24	682	24	691	24	-5	-10	-1	-1%	-1%	0%
Horsenden Lane	NB	321	14	302	13	321	13	334	14	-18	0	13	-6%	0%	4%
	SB	304	8	298	8	297	8	299	8	-6	-7	-5	-2%	-2%	-2%
Greenford Road (north of Uneeda Drive)	NB	550	2	481	3	517	2	553	3	-69	-33	3	-13%	-6%	1%
	SB	496	2	495	2	499	2	508	3	-1	3	12	0%	1%	2%
Greenford Road (south of Uneeda Drive)	NB	999	36	995	38	995	37	1021	37	-4	-4	21	0%	0%	2%
	SB	955	40	947	40	948	40	962	40	-8	-7	6	-1%	-1%	1%
Oldfield Lane (north of Uneeda Drive)	NB	631	17	592	17	618	17	641	17	-39	-13	10	-6%	-2%	2%
	SB	482	13	480	13	484	13	495	13	-2	2	14	0%	0%	3%
Mandeville Road (north of Eastcote Lane)	NB	1222	26	1239	26	1183	26	1166	26	17	-39	-57	1%	-3%	-5%
	SB	818	21	826	22	830	21	827	20	8	12	9	1%	1%	1%
Mandeville Road (south of Eastcote Lane)	NB	1500	32	1519	31	1473	32	1447	35	19	-27	-53	1%	-2%	-4%
	SB	503	33	502	33	506	33	515	32	0	4	12	0%	1%	2%
Eastcote Lane	EB	669	9	634	8	635	8	645	8	-35	-34	-24	-5%	-5%	-4%
	WB	489	10	459	10	490	10	527	11	-31	0	37	-6%	0%	8%

6.8.33 As for the AM peak hour the table shows that flow changes are relatively small within CFA5, and these are generally reflected in small percentage changes. Where there are large percentage changes, these are still relatively small numbers but on a low base. The variability in the numbers is a reflection of the modelled impact of congestion.

6.8.34 The highest percentage increases are on Alperton Lane southbound (23% or 66 vehicles per hour) and Alperton Lane northbound (15% or 55 vehicles per hour).

Local junction performance

6.8.35 The following tables examine the performance of individual junctions in the baseline and future baseline assessment years.

Western Avenue / Wales Farm Road / Leamington Park (on boundary of CFA4/CFA5)

6.8.36 Table 6-281 shows the impacts at this junction. The model shows that Western Avenue eastbound approach to the junction operates beyond its practical capacity in the AM peak hour in every modelled scenario, with minor increases in flows, degree of saturation and maximum queue from 2012 to 2041. Other arms in the AM peak, and all arms in the PM peak, operate within their practical capacity.

Table 6-281: Forecast baseline performance at Western Avenue / Wales Farm Road / Leamington Park (signals)

CFA4/5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Western Avenue (EB)	3230	98	36	3260	99	38	3273	99	40	3311	100	40
Wales Farm Road	1316	46	24	1215	42	22	1259	44	23	1340	46	24
Western Avenue (WB)	2586	66	31	2619	66	31	2673	68	32	2765	70	33
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Western Avenue (EB)	2784	75	26	2833	77	27	2910	79	28	2984	80	28
Wales Farm Road	1193	49	27	1229	50	28	1317	54	30	1424	58	32
Western Avenue (WB)	2999	68	35	3054	68	36	3060	68	36	3103	68	36

Friary Road / Friary Road (on boundary of CFA4/CFA5)

6.8.37 Table 6-282 shows the impacts at this junction. The model shows that the junction operates within capacity during both AM and PM peak hours in all modelled periods.

Table 6-282: Forecast baseline performance at Friary Road / Friary Road (priority junction)

CFA4/5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Friary Road (EB)	145	11	0	151	12	0	152	13	0	144	12	0
Friary Road (NB)	160	20	0	146	18	0	145	18	0	157	19	0
Friary Road (WB)	122	6	0	122	6	0	125	6	0	137	7	0

	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Friary Road (EB)	64	5	0	73	6	0	69	6	0	70	6	0
Friary Road (NB)	246	24	0	248	25	0	259	26	0	271	27	0
Friary Road (WB)	149	7	0	142	7	0	140	7	0	142	7	0

Acton Lane / Mordaunt Road

6.8.38 Table 6-283 shows the impacts at this junction. The model shows that the junction operates over capacity during both AM and PM peak hours in all modelled periods. In the AM peak Acton Lane northbound is the arm that shows the highest RFC, while in the PM peak it is Mordaunt Road.

Table 6-283: Forecast baseline performance at Acton Lane / Mordaunt Road (signals)

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mordaunt Road	630	62	8	650	63	9	642	62	9	693	66	9
Acton Lane (SB)	221	55	4	190	47	3	201	50	3	220	55	4
Acton Lane (NB)	371	108	6	376	107	6	370	107	6	375	108	6
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mordaunt Road	283	109	5	289	108	5	285	108	5	287	110	5
Acton Lane (SB)	390	44	5	389	45	5	405	47	5	419	49	5
Acton Lane (NB)	529	68	6	580	74	7	589	75	7	627	80	7

Horn Lane / Friary Road

6.8.39 Table 6-284 shows the impacts at this junction. The model shows that the junction operates over its practical capacity during both AM and PM peak hours in all modelled periods.

Table 6-284: Forecast baseline performance at Horn Lane / Friary Road (signals)

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	712	92	9	679	88	9	691	89	9	718	92	9
Friary Road (WB)	141	33	3	134	32	3	144	34	3	182	43	4
Horn Lane (NB)	776	92	10	762	88	10	763	89	10	759	90	10

	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	381	94	4	379	93	4	384	95	4	391	96	4
Friary Road (WB)	328	76	4	316	73	4	323	75	4	336	77	5
Horn Lane (NB)	486	85	6	479	83	6	487	85	6	497	87	6

Hanger Lane Gyratory (northwest corner)

6.8.40 Table 6-285 shows the impacts at this junction. During the AM peak the Hanger Lane approach to the junction operates at practical capacity in 2012 and modest flow increases take this above practical capacity in the 2041 scenario. At these flows, intermediate peaks within the peak hour would result in a rapid build-up of congestion.

Table 6-285: Forecast baseline performance at Hanger Lane Gyratory (northwest corner) (signals)

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Hanger Lane	1366	89	19	1349	88	19	1385	90	20	1428	92	20
Roundabout (NB)	4866	53	17	4753	52	17	4876	53	17	5025	54	17
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Hanger Lane	1251	75	18	1216	73	17	1211	73	17	1304	78	18
Roundabout (NB)	4921	55	19	4813	53	18	4979	55	19	5219	57	20

Hanger Lane / West Gate

6.8.41 Table 6-286 shows the impacts at this junction. The model shows that the junction operates comfortably within capacity during both AM and PM peak hours in all modelled periods.

Table 6-286: Forecast baseline performance at Hanger Lane / West Gate (signals)

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Hanger Lane (SB)	1346	43	5	1329	43	5	1365	44	5	1408	45	5
Hanger Lane (NB)	961	36	3	934	35	3	935	35	3	973	36	3
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Hanger Lane (SB)	1232	38	6	1196	37	6	1191	36	6	1284	39	6
Hanger Lane (NB)	1106	39	5	1138	40	5	1105	39	5	1119	38	5

Ealing Road / Hanger Lane / Alperton Lane

6.8.42 Table 6-287 shows the impacts at this junction. The model shows that the junction operates within capacity during both AM and PM peak hours in all modelled periods.

Table 6-287: Forecast baseline performance at Ealing Road / Hanger Lane / Alperton Lane

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Ealing Road	1113	30	0	1100	30	0	1127	31	0	1159	32	0
Hanger Lane	961	48	0	934	47	0	935	47	0	973	48	0
Alperton Lane	367	36	1	369	35	1	370	36	1	365	36	1
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Ealing Road	880	29	0	849	28	0	837	27	0	938	30	0
Hanger Lane	1106	56	0	1138	57	0	1105	55	0	1119	55	0
Alperton Lane	272	29	3	266	29	3	278	30	2	287	31	3

Greenford Road / Rockware Avenue

6.8.43 Table 6-288 shows the impacts at this junction. The model shows that the Greenford Road northbound approach to the junction will continue to operate beyond its practical capacity in the AM peak and beyond its theoretical maximum capacity in the PM peak in all future baseline scenarios, with small changes in traffic flows.

Table 6-288: Forecast baseline performance at Greenford Road / Rockware Avenue

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Greenford Road (SB)	540	66	6	530	65	6	538	66	6	553	67	6
Greenford Road (NB)	918	91	12	907	90	12	906	90	12	936	93	13
Rockware Avenue	77	64	7	65	62	6	62	61	6	91	65	7
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Greenford Road (SB)	486	78	6	486	76	6	490	76	6	498	77	6
Greenford Road (NB)	1036	105	13	1033	104	13	1033	104	13	1058	105	13
Rockware Avenue	150	73	8	101	63	7	135	68	7	155	72	8

Church Road / Target Roundabout

6.8.44 Table 6-289 shows the impacts at this junction. The model shows that the junction operates comfortably within capacity during both AM and PM peak hours in all modelled periods.

Table 6-289: Forecast baseline performance at Church Road / Target Roundabout (signals)

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Church Road	1072	26	0	1056	26	0	1051	26	0	1070	26	0
Target Roundabout (EB)	1189	29	0	1197	29	0	1224	30	0	1283	31	0
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Church Road	535	13	0	536	13	0	539	13	0	546	13	0
Target Roundabout (EB)	1532	37	0	1551	37	0	1505	36	0	1482	35	0

Mandeville Road / Eastcote Lane

6.8.45 Table 6-290 shows the impacts at this junction. The model shows that the junction operates over its practical capacity during both AM and PM peak hours in all modelled periods, with increases to flow, RFC and queuing between 2012 and 2041.

Table 6-290: Forecast baseline performance at Mandeville Road / Eastcote Lane (priority junction)

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mandeville Road (SB)	882	91	9	868	90	9	866	90	9	878	91	9
Mandeville Road (NB)	1220	96	15	1223	96	15	1241	98	16	1275	101	16
Eastcote Lane	554	101	12	548	99	12	552	98	12	562	100	12
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mandeville Road (SB)	839	76	7	847	77	7	851	77	7	847	77	7
Mandeville Road (NB)	1529	104	15	1528	103	15	1508	103	15	1521	104	15
Eastcote Lane	425	96	9	394	91	9	396	91	9	402	92	9

Pett's Hill / Wood End Road / Mandeville Road

6.8.46 Table 6-291 shows the impacts at this junction. The model shows that the junction operates within capacity during both AM and PM peak hours in all modelled periods.

Table 6-291: Forecast baseline performance at Pett's Hill / Wood End Road / Mandeville Road (priority junction)

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Pett's Hill	354	17	0	344	17	0	335	17	0	323	16	0
Wood End Lane	346	34	0	333	32	0	363	35	0	407	39	0
Mandeville Road	766	42	0	784	44	0	786	44	0	832	44	0

CFA5	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Pett's Hill	367	18	0	378	19	0	384	19	0	385	19	0
Wood End Lane	386	37	0	396	38	0	382	37	0	379	37	0
Mandeville Road	813	43	0	840	45	0	785	42	0	753	40	0

Accidents and safety

- 6.8.47 Collision data for the 36 month period from April 2009 to March 2012 in the vicinity the CFA5 worksites revealed a few clusters at or near the locations of proposed worksites. The main cluster of collisions occurs to the south along the A40 corridor to the south.
- 6.8.48 There are no issues identified for the future baseline network operation as a result of changes to the highway network or travel demands and, therefore, accident and safety records for the future baseline assessment are assumed to be the same as those for the baseline assessment.

Rail

- 6.8.49 The area will be affected by the introduction of Crossrail services at Acton Main Line, and to a lesser extent (as distance from HS2 route increases) at Ealing Broadway, Hanwell and Southall stations. Changes to flows on the rail network are shown in CFA1 for the future baselines .

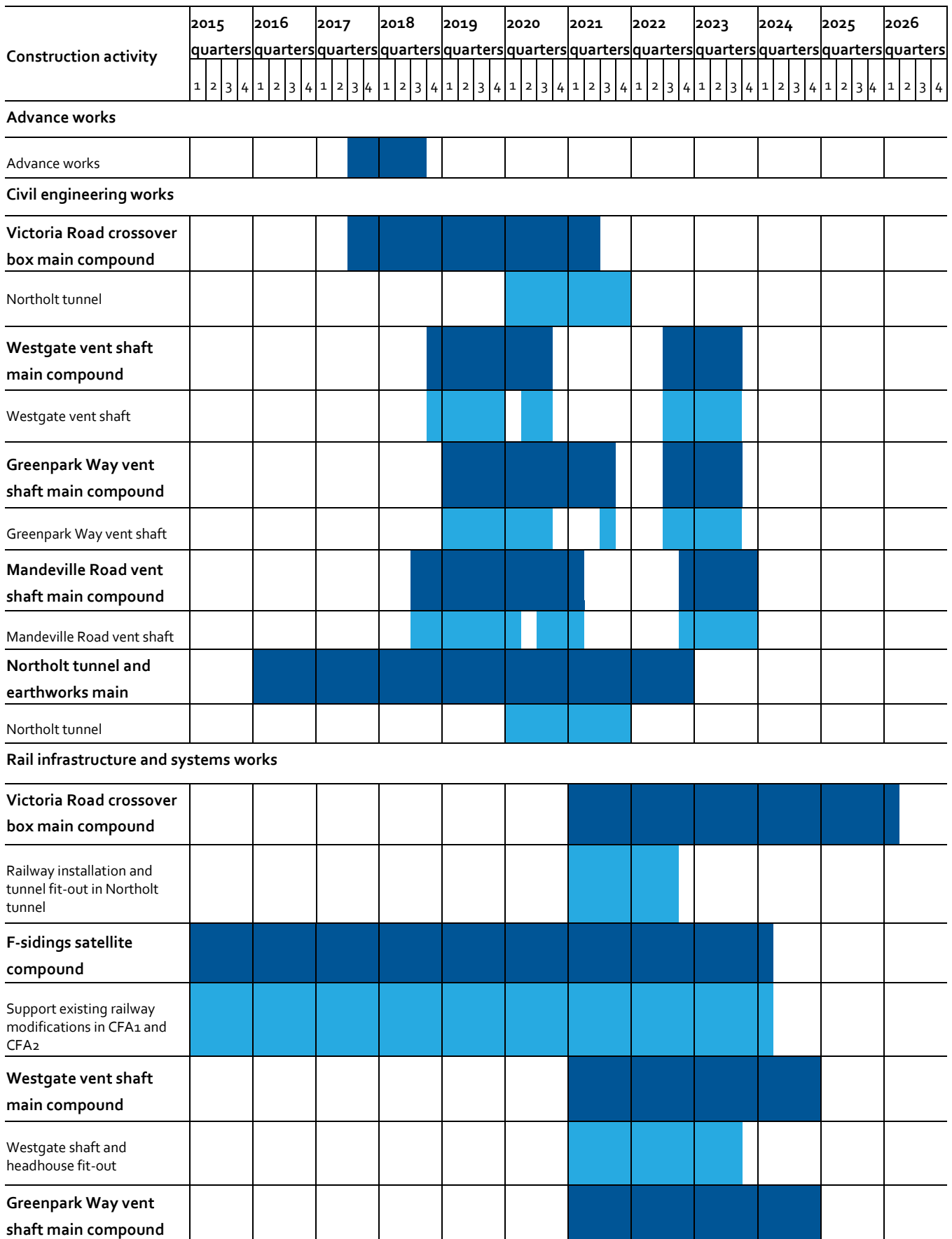
Northolt Corridor (CFA5) Proposed Scheme construction description

- 6.8.50 The temporary traffic and transport impacts within this CFA are due to construction vehicle movements to/from the main vent shaft construction compounds at Westgate, Greenpark Way and Mandeville Road. These movements include the delivery of plant and materials, movement of excavated materials, and construction compound worker trips.
- 6.8.51 This section provides an overview of the construction traffic and transport impacts for the section of HS2 that passes through the Northolt Corridor Community Forum Area (CFA5). This CFA includes three worksites: at West Gate, Greenpark Way and Mandeville Road. An additional worksite, F-Sidings, is located within this CFA but will be used mainly for night-time, weekend and bank holiday activities and generate negligible volumes of traffic.
- 6.8.52 The construction period for the whole route is programmed for 2017 to 2026. The base year for assessment of construction impacts has been chosen at 2021. The forecast peak construction activities have then been overlaid on 2021, with, as relevant, overlapping activities (in both area of importance and timing) considered in combination.

Construction activities

- 6.8.53 The main construction works and the time periods when each compound is operational are summarised below in Figure 6-209.

Figure 6-209: Northolt Corridor (CFA5) construction activity phasing



Construction activity	2015				2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				2026			
	quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Greenpark Way shaft and headhouse fit-out																																																
Greenpark Way express feeder auto-transformer station installation																																																
Modifications to existing railway																																																
Mandeville Road vent shaft main compound																																																
Mandeville Road shaft and headhouse fit-out																																																
Northolt tunnel and earthworks main compound																																																
Railway installation and tunnel fit-out in Northolt tunnel																																																
Commissioning																																																
Test and commissioning of the railway																																																

Compounds and construction sites

- 6.8.54 The temporary traffic and transport impacts within this CFA are due to construction vehicle movements to/from the three shaft main site compounds at Westgate, Greenpark Way and Mandeville Road. It is expected that the F-sidings satellite compound will generate negligible volumes of traffic, mostly during night time, weekends and bank holiday periods, and therefore minimal impact is anticipated.
- 6.8.55 Construction vehicle movements required to construct the Proposed Scheme include the delivery of plant and materials, movement of excavated materials and construction compound worker trips. As set out in the description of the regional construction strategy the relevant sites for CFA5 are shown below.

Table 6-292: C221 Worksite Compound Details (also showing workers & staff) for CFA5 only

Type	Location	(Chainage)	Principal use	No of workers	No of staff
Satellite Compound and Facilities	Waxlow Road	011+000	Support modifications to existing railway infrastructure	50	10
Main Site Compound and Facilities	Westgate Shaft	012+800	Westgate Shaft	21	13

Type	Location	(Chainage)	Principal use	No of workers	No of staff
Main Site Compound and Facilities	Greenpark Way Shaft	015+600	Greenpark Way Shaft & Greenpark Way express feeder auto-transformer station	11	2
Main Site Compound and Facilities	Mandeville Road Shaft	017+800	Mandeville Road Shaft	21	15

6.8.56 The timing and duration of busy transport activity at each construction compound is shown in Table 6-293. This represents the periods when the construction traffic flows will be greater than 50% of the peak flows. Also shown is the estimated number of daily vehicle trips during the peak month of activity, the lower end of the range shows the average number of trips and the upper end the peak flows. The assessment scenario has assumed the peak month for the combination of activities, i.e. not necessarily the peak activity at each individual site.

Table 6-293: Northolt Corridor (CFA5) typical vehicle trip generation for construction compounds

Compound type	Location	Access to/from compound	Indicative start/set up date	Estimated duration of use (Years)	Estimated duration with busy vehicle movements (Months)	Average daily combined two-way vehicle trips during busy period and within peak month of activity	
						Cars/LGV	HGV
Main compound	Westgate vent shaft	Westgate Road	September 2018	5.5	Under 1 month	10-20	90-110
Main compound	Greenpark Way vent shaft	Rockware Avenue / Greenpark Way	January 2019	5.5	Under 1 month	10-20	90-110
Main compound	Mandeville Road vent shaft	Mandeville Road	July 2018	7	Under 1 month	10-20	95-110
Satellite compound	F-sidings compound	Waxlow Road	2015	9	Under 1 month	<5	<5

Construction lorry routes

6.8.57 The final approach to the three worksites for construction lorry traffic in this CFA are shown in Figure 6-206 to Figure 6-208 and immediate approaches are shown and described below.

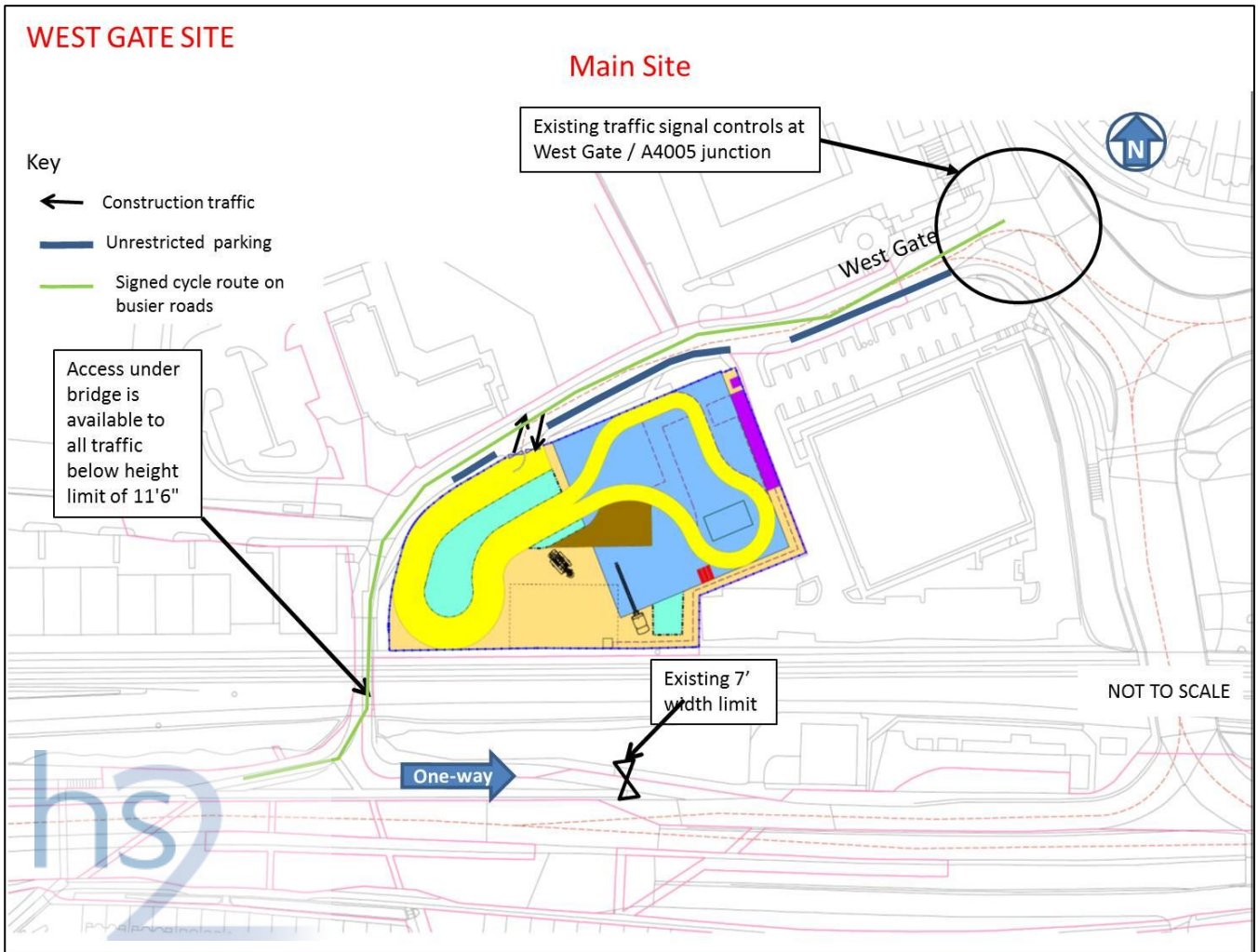
F-sidings Satellite Compound

6.8.58 This site is located in the Willesden Freight Sidings to the north of Waxlow Road, which will also be the access point. Access to and from the A40 Western Avenue will be via the B4492 Acton Lane/Coronation Road.

West Gate Main Site Compound

- 6.8.59 Figure 6-210 below shows the main access and egress for the West Gate vent shaft site from the east via a traffic signal controlled junction at West Gate / A4005 Hanger Lane and thence to the A40 Western Avenue. To the west of the site access is limited as West Gate passes beneath a railway bridge with a height limit of 11'6" and thence to the A40 Western Avenue via a 7' width limit.

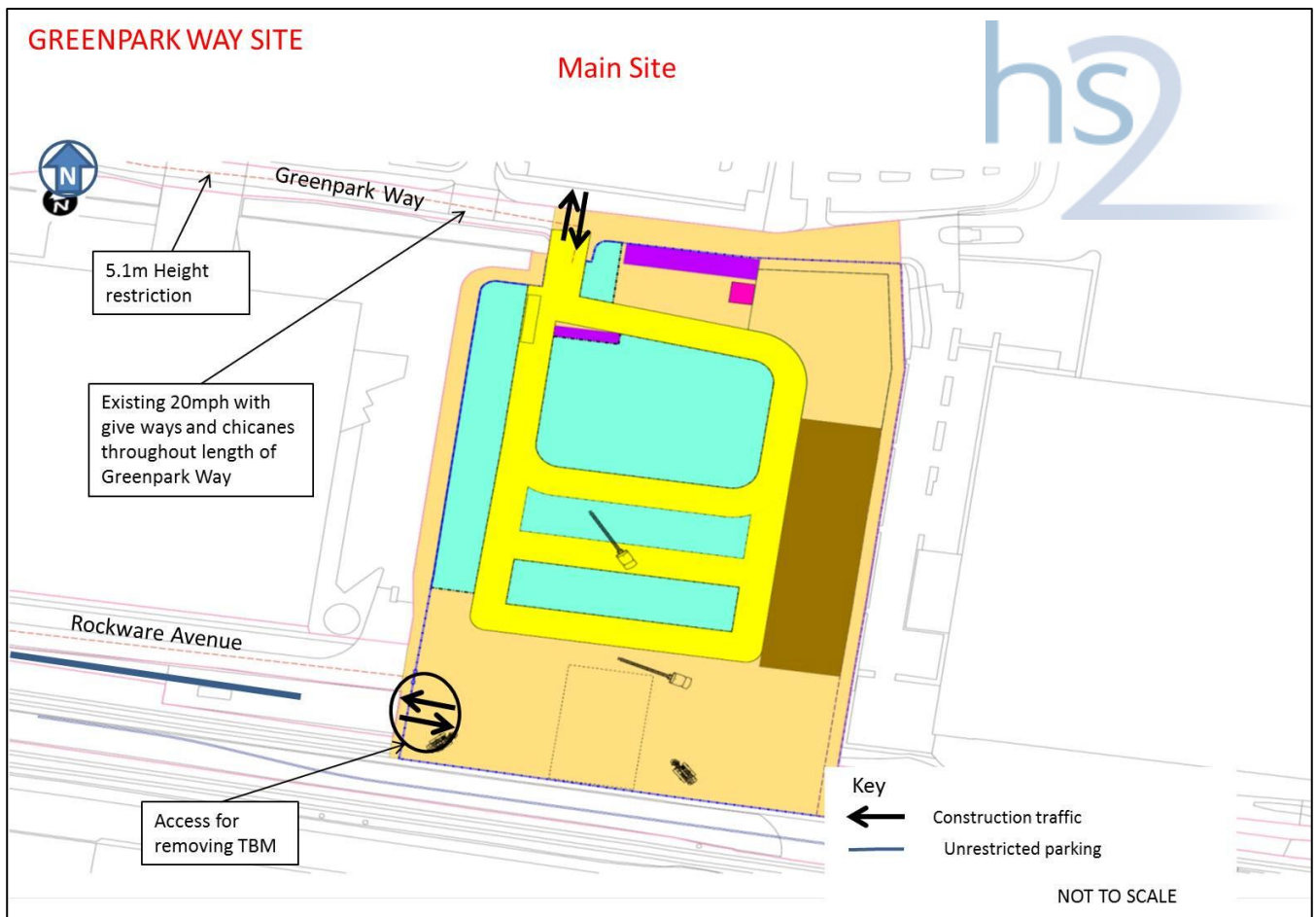
Figure 6-210: West Gate Vent Shaft site and local access and egress



Greenpark Way

- 6.8.60 The main access and egress for the Greenpark Way vent shaft site is from the west via the A4127 Greenford Road / Greenpark Way traffic signal junction as shown in Figure 6-211. Greenpark Way is a no through road and is within a 20mph zone, with kerb build outs forming chicanes with give way markings along its entire length. There is a 5.2m height restriction on the road where it passes beneath the IBM building which spans the road.
- 6.8.61 The site can also be accessed from Rockware Avenue and this may be used for removal of the tunnel boring machine.

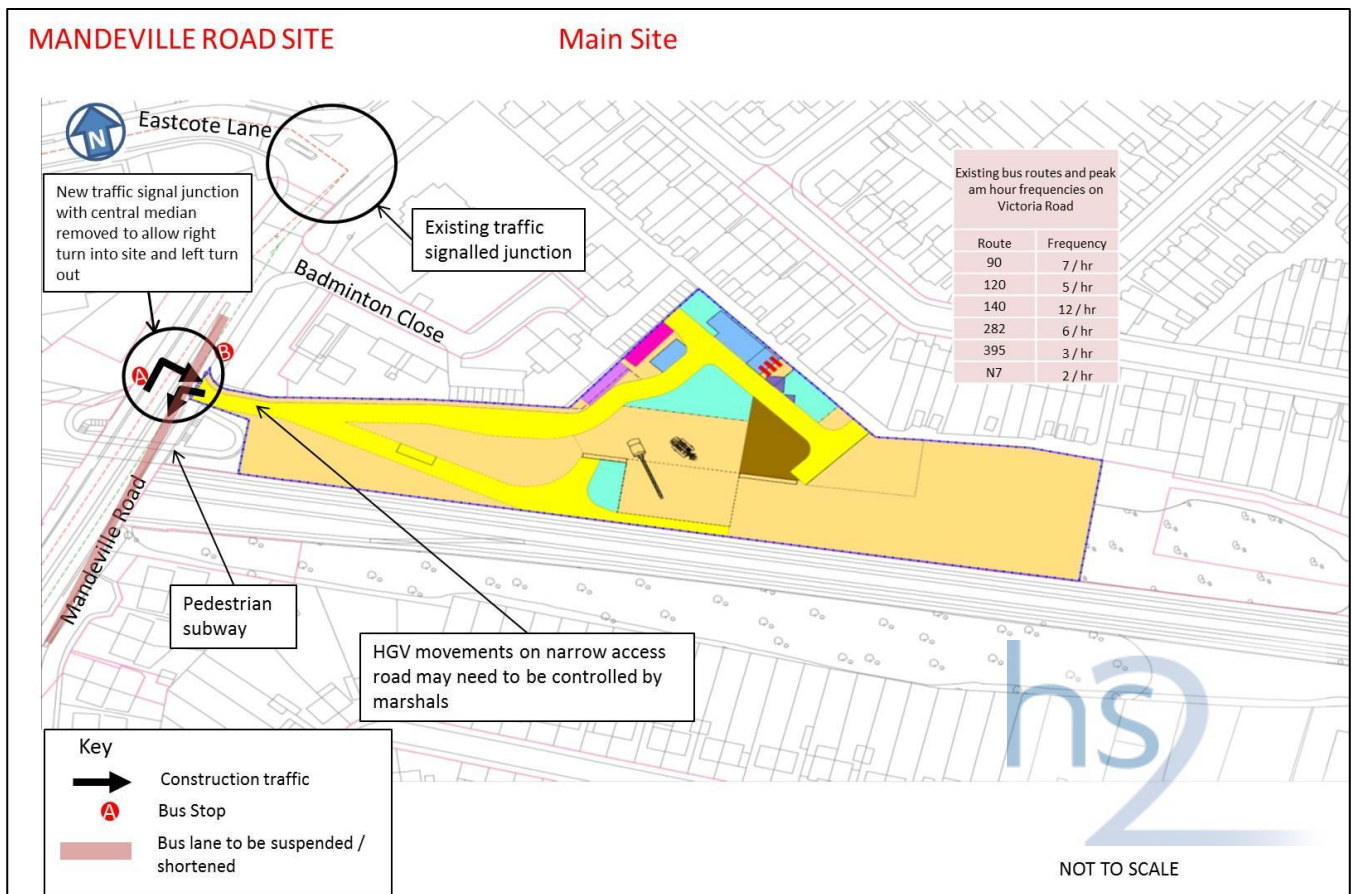
Figure 6-211: Greenpark Way Vent Shaft site and local access and egress



Mandeville Road

- 6.8.62 The main access and egress for the Mandeville Road vent shaft site is from the A312 Mandeville Road as shown on Figure 6-212. It is proposed to install temporary traffic signal controls on Mandeville Road to manage turning movements into and out of the site to and from the south. There is an existing southbound bus stop (B) located immediately to the north of the site entrance on the east side of Mandeville Road. This will be relocated to the north of the nearby traffic signal controlled junction of Eastcote Lane / Mandeville Road, away from the site entrance and temporary signal controls, for safety reasons.
- 6.8.63 HGV movements within the relatively narrow site access road will be controlled by marshals / banksmen.
- 6.8.64 Immediately to the south of the site access road on Mandeville Road there are steps leading down to a pedestrian subway which runs beneath Mandeville Road. There is also a pelican crossing facility on the south side of the railway bridge, some distance from the site entrance.

Figure 6-212: Mandeville Road Vent Shaft site and local access and egress



Traffic management, road closures and diversions

- 6.8.65 There is a possibility of temporary partial road closures on Westgate, A4127 Greenpark Way, Rockware Avenue and the A312 Mandeville Road during the enabling stages. These are not expected to result in full road closures and, therefore, will not require traffic diversions.
- 6.8.66 Aside from that, it is expected that there would be no road closures or traffic management that would lead to a need to provide specific diversion routes for work at worksite compounds within CFA5.

Avoidance and mitigation measures

- 6.8.67 The following measures (as outlined in Section 2) have been included as part of the engineering design of the Proposed Scheme and will avoid or reduce effects on transport users:
- the Proposed Scheme in this CFA has been designed in tunnel, so major impacts associated with bridge replacement works have been avoided
 - the tunnelling strategy has been selected to avoid excavated material from tunnels being extracted from vent shafts. Instead this will be transported off site via rail, dramatically reducing HGVs on the road network;
 - lorry routes for construction equipment and materials are defined to ensure only the most suitable roads are used; and
 - HGVs are routed, as far as reasonably practicable, along the strategic road and

using designated roads for access, network as shown on Figure 6-206 to Figure 6-208.

- 6.8.68 The draft CoCP (see Volume 5: Appendix CT-003-000/1) includes measures which seek to reduce the impacts and effects of deliveries of construction materials and equipment, including reducing construction lorry trips during peak background traffic periods. The draft CoCP includes HGV management and control measures.
- 6.8.69 An over-arching framework travel plan will be produced that will set out how travel plans can be used along with a range of potential measures to mitigate the impacts of traffic and transport movements associated with construction of the Proposed Scheme. As part of this, a construction workforce travel plan will be put into operation with the aim of reducing workforce commuting by private car, especially sole occupancy car travel. Where practical, particularly in the urban context, this will encourage the use of sustainable modes of transport.
- 6.8.70 The measures in the CoCP will include clear controls on vehicle types, hours of site operation, and routes for heavy goods vehicles, to reduce the impact of road based construction traffic. In order to achieve this, generic and site specific traffic management measures will be implemented during the construction of the Proposed Scheme on or adjacent to public roads, bridleways, footpaths and other PRow affected by the Proposed Scheme as necessary.
- 6.8.71 Specific measures as set out in the CoCP will include:
- core construction compound operating hours will be 08:00-18:00 on weekdays and 08:00 to 13:00 on Saturdays and compound staff and workers will therefore generally arrive before the morning peak hour and depart after the evening peak hour (although the assessment has assumed that some of work journeys to the construction compounds take place within the morning and evening peak hours to reflect a reasonable worst case scenario);
- 6.8.72 Tunnelling and directly associated activities (such as removal of excavated material, supply of materials and maintenance of tunnelling equipment) will be carried out on a 24 hour day, 7 day week basis. Where reasonably practicable, material will be stockpiled within the site boundary for removal during normal working hours. For further information refer to CoCP.
- excavated material will be reused wherever reasonably practicable along the alignment of the Proposed Scheme which will reduce the effects of construction vehicles on the public highway; and
 - construction deliveries will be planned for outside the peak hours wherever reasonably practicable.
 - where reasonably practicable, the number of private car trips to and from the construction compounds (both workforce and visitors) will be reduced by encouraging alternative modes of transport or vehicle sharing.

Northolt Corridor (CFA5) construction impacts

Key construction transport issues

- 6.8.73 Construction of HS2 in this area will have temporary effects which will include increased traffic demand associated with material movement and workers on a number of roads through the area. The following sections consider in detail the effects.
- 6.8.74 There will be no impact from construction upon access to stations and station passenger flows at Northolt, Greenford and Perivale.
- 6.8.75 There will be minimal impact upon PROW resulting in, at most, very localised pedestrian diversions (e.g. crossing to the other side of a minor local road).
- 6.8.76 Within the study area, it is expected that there will be minimal traffic and transport impacts apart from traffic related to the construction compounds at Westgate Road, Greenpark Way and Mandeville Road as most of the traffic and transport effects have been removed by the route being in tunnel under this area.
- 6.8.77 The phasing of the construction works will therefore mean that not all the above movements will occur at the same time and the programme of peak construction works at each compound will in practice not be simultaneous.
- 6.8.78 It is envisaged that the A40 Western Avenue, M25 motorway and Transport for London Road Network will provide the primary HGV access and egress routes.
- 6.8.79 As discussed above, there is a possibility of temporary partial road closures on Westgate, Rockware Avenue and the A312 Mandeville Road during the enabling stages. These are not expected to result in full road closures and therefore no associated traffic diversions

Strategic and local road network traffic flows

- 6.8.80 Table 6-294 and Table 6-295 set out flows on key roads, comparing 2021 baseline flows with 2021 construction case flows along the Hs2 construction.
- 6.8.81 As explained in the regional section, the scenarios considered are:
- WeLHAM Construction Test 1 refers to late 2017-early 2018 with peak construction HGV movements leading up to the start of operation of the Willesden Railhead
 - WeLHAM construction Test 2 refers to the planned closure of Old Oak Common Lane for construction purposes within CFA4 over periods in 2023-2024.

Table 6-294: WelHAM AM peak hour model screenline analysis for construction tests

		Future		2021		Test 1 change from 2021				2021		Test 2 change from 2021			
		Baseline 2021		Test 1		future baseline				Test 2		future baseline			
Location	Direction	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles %	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles
CFA5															
Coronation Road	EB	228	14	227	14	-1	0	0%	0%	228	14	0	0	0%	0%
	WB	33	10	33	10	0	0	0%	0%	33	10	0	0	0%	0%
Connell Crescent bridge	EB	345	8	344	8	-1	0	0%	0%	344	8	-1	0	0%	0%
	WB	15	0	15	0	0	0	-1%	0%	15	0	0	0	-2%	0%
Hanger Lane East Bridge	SB	5034	304	5033	303	-2	0	0%	0%	5041	306	7	2	0%	1%
Hanger Lane West Bridge	NB	4516	236	4511	236	-6	0	0%	0%	4523	236	6	0	0%	0%
Alperton Lane	NB	548	1	543	1	-5	0	-1%	2%	550	1	3	0	0%	10%
	SB	368	38	369	38	0	0	0%	0%	367	38	-1	0	0%	-1%
Bideford Avenue	NB	309	10	309	10	0	0	0%	0%	309	10	0	0	0%	0%
	SB	432	27	430	27	-1	0	0%	0%	431	27	-1	0	0%	0%
Horsenden Lane	NB	245	8	244	8	-1	0	0%	0%	245	8	0	0	0%	0%
	SB	255	23	254	23	-1	0	0%	0%	254	23	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	420	16	422	16	2	0	1%	0%	420	15	0	0	0%	-1%
	SB	541	8	541	8	1	0	0%	1%	542	8	1	0	0%	2%
Greenford Road (south of Uneeda Drive)	NB	821	86	822	86	1	0	0%	0%	823	86	2	0	0%	0%
	SB	851	65	852	65	1	0	0%	0%	852	65	1	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	316	19	321	19	5	0	2%	0%	322	19	6	0	2%	1%
	SB	633	23	632	23	-1	0	0%	-1%	632	23	-1	0	0%	-1%
Mandeville Road (north of Eastcote Lane)	NB	1245	42	1245	42	-1	0	0%	0%	1242	42	-4	0	0%	0%
	SB	832	35	833	35	1	0	0%	0%	833	35	1	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1137	60	1144	60	7	0	1%	0%	1144	60	7	0	1%	0%
	SB	1005	51	1002	51	-3	0	0%	0%	1002	51	-3	0	0%	0%
Eastcote Lane	EB	651	13	653	13	2	0	0%	0%	652	13	1	0	0%	1%
	WB	322	12	333	12	11	0	3%	1%	335	12	13	0	4%	1%

6.8.82 The screenline analysis for the AM peak hour shows that the impacts on general traffic flows in CFA5 are minimal. The highest percentage change is on Eastcote Lane westbound (4% or 13 vehicles per hour in construction test 2).

Table 6-295: WeLHAM PM peak hour model screenline analysis for construction tests

		Future		2021		Test 1 change from 2021				2021		Test 2 change from 2021			
		Baseline 2021		Test 1		future baseline				Test 2		future baseline			
Location	Direction	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles %	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles
CFA5															
Coronation Road	EB	123	12	122	12	0	0	0%	0%	126	13	3	0	2%	3%
	WB	62	10	62	10	0	0	0%	0%	59	10	-3	0	-4%	0%
Connell Crescent bridge	EB	135	5	135	5	0	0	0%	1%	139	6	3	1	2%	1%
	WB	45	0	45	0	0	0	0%	0%	45	0	0	0	0%	0%
Hanger Lane East Bridge	SB	4648	145	4635	145	-13	0	0%	0%	4687	146	39	1	1%	1%
Hanger Lane West Bridge	NB	4667	146	4642	146	-25	0	-1%	0%	4675	148	8	2	0%	1%
Alperton Lane	NB	369	0	374	0	5	0	1%	1%	375	0	5	0	1%	0%
	SB	286	2	285	2	0	0	0%	-1%	287	2	1	0	0%	2%
Bideford Avenue	NB	232	7	231	7	-1	0	0%	-1%	233	7	1	0	1%	0%
	SB	687	24	687	24	0	0	0%	0%	688	24	1	0	0%	0%
Horsenden Lane	NB	302	13	305	13	3	0	1%	-1%	306	12	3	-1	1%	-6%
	SB	298	8	298	8	0	0	0%	-1%	296	8	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	481	3	481	2	0	0	0%	-8%	486	3	4	0	1%	0%
	SB	495	2	502	2	7	0	1%	0%	497	2	2	0	0%	4%
Greenford Road (south of Uneeda Drive)	NB	995	38	998	38	3	0	0%	0%	1000	39	5	0	1%	0%
	SB	947	40	952	40	5	0	1%	0%	949	40	1	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	592	17	596	17	4	0	1%	1%	594	17	3	0	0%	0%
	SB	480	13	480	13	0	0	0%	0%	481	13	1	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1239	26	1239	26	0	0	0%	0%	1232	26	-7	0	-1%	0%
	SB	826	22	829	22	4	0	0%	0%	830	21	4	0	0%	-1%
Mandeville Road (south of Eastcote Lane)	NB	1519	31	1519	31	-1	0	0%	1%	1516	31	-3	0	0%	0%
	SB	502	33	505	33	3	0	1%	0%	502	33	0	0	0%	0%
Eastcote Lane	EB	634	8	635	8	1	0	0%	0%	632	8	-2	0	0%	0%
	WB	459	10	463	10	4	0	1%	0%	467	10	8	0	2%	0%

- 6.8.83 The PM peak hour leads to very similar conclusions as for the AM peak hour, with the most significant increase being only 2% (10 vehicles per hour) on Eastcote Lane westbound.
- 6.8.84 Therefore it can be concluded that the construction interventions have minimal impact on roads within CFA5 at a strategic level.

Summary of Link flow impacts in 2021

- 6.8.85 The plots above show that increases in traffic as a result of the Proposed Scheme are entirely access trips to and from construction compounds in the Old Oak Common station area in CFA4, with much lower flows arising from construction sites in CFA5.
- 6.8.86 In 2021, the impact of traffic accessing construction compounds in Old Oak Common area is primarily on local roads leading to and from the station with some onward movements on the strategic network. Due to the relatively low number of vehicle movements on routes that are close to capacity, there are few impacts.
- 6.8.87 The modelling shows that construction of the Proposed Scheme will result in significant increases in peak hour traffic flows of more than 10% in the two construction tests as shown in Table 6-296 and Table 6-297, potentially causing an increase in traffic-related severance for non-motorised users. N/A is used to indicate where the link will only experience a substantial increase for one traffic category (i.e. only HGV traffic).

Table 6-296: Summary of impacted links CFA5 2026 construction test 1 (AM and PM average)

2021 Construction test 1 assessment		Increase in General Traffic		Increase in HGVs	
CFA	Roads impacted by increase	PCU	%	PCU	%
5	A40 westbound off-slip (Perivale)	N/A	N/A	29	143%

Table 6-297: Summary of impacted links CFA5 2026 construction test 2 (AM and PM average)

2021 Construction test 2 assessment		Increase in General Traffic		Increase in HGVs	
CFA	Roads impacted by increase	PCU	%	PCU	%
5	Friary Road	N/A	N/A	4	70%
5	Friars Way	64	35%	4	94%
5	St Dunstan's Avenue	64	35%	4	94%
5	A40 westbound off-slip (Perivale)	N/A	N/A	28	139%

- 6.8.88 Congestion on the A40 leads the model to predict small increases in flow where these are unlikely to occur. In this instance, the A40 westbound off-slip at Perivale, Friars Way and St Dunstan's Avenue because the road network is such that they are unlikely to experience any impact.

Junction performance

- 6.8.89 Closer analysis has also been undertaken on key junctions around the sites and on approaches to identify the impacts of HGV construction traffic flows and more localised junction impacts. The following sections and tables set out the impact of these construction scenarios at individual junctions.

Western Avenue / Wales Farm Road / Leamington Park

- 6.8.90 Table 6-298 below shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small. However, again the A40 Western Avenue operates at capacity.

Table 6-298: Construction impacts at Western Avenue / Wales Farm Road / Leamington Park (signals)

CFA4/5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Western Avenue (EB)	3260	99	38	3260	99	38	3264	99	39
Wales Farm Road	1215	42	22	1242	43	22	1364	47	25
Western Avenue (WB)	2619	66	31	2613	66	31	2701	68	32
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Western Avenue (EB)	2833	77	27	2830	77	27	2847	77	27
Wales Farm Road	1229	50	28	1250	51	28	1225	50	28
Western Avenue (WB)	3054	68	36	3056	68	36	3148	69	36

Friary Road / Friary Road (on boundary of CFA4/CFA5)

- 6.8.91 Table 6-299 below shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-299: Construction impacts at Friary Road / Friary Road (priority junction)

CFA4/5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	679	88	9	677	87	9	718	92	9
Friary Road (WB)	134	32	3	134	32	3	152	36	3
Horn Lane (NB)	762	88	10	765	89	10	758	90	10

	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	379	93	4	380	94	4	383	94	4
Friary Road (WB)	316	73	4	318	73	4	325	75	4
Horn Lane (NB)	479	83	6	480	83	6	495	86	6

Acton Lane / Mordaunt Road

6.8.92 Table 6-300 below shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. While the junction is already over capacity, it can be seen that the construction traffic impacts are relatively small.

Table 6-300: Construction impacts at Acton Lane / Mordaunt Road (signals)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mordaunt Road	650	63	9	652	63	9	594	58	8
Acton Lane (SB)	190	47	3	190	47	3	192	48	3
Acton Lane (NB)	376	107	6	377	107	6	374	107	6
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mordaunt Road	289	108	5	290	109	5	289	108	5
Acton Lane (SB)	389	45	5	389	45	5	402	47	5
Acton Lane (NB)	580	74	7	581	74	7	602	77	7

Horn Lane / Friary Road

6.8.93 Table 6-301 below shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. It can be seen that the junction is already very close to (AM) and just over (PM) its practical capacity, and small increases in flow in both construction tests increase the RFC, although with no anticipated increase in queuing.

Table 6-301: Construction impacts at Horn Lane / Friary Road (signals)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	679	88	9	677	87	9	718	92	9
Friary Road (WB)	134	32	3	134	32	3	152	36	3
Horn Lane (NB)	762	88	10	765	89	10	758	90	10

	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	379	93	4	380	94	4	383	94	4
Friary Road (WB)	316	73	4	318	73	4	325	75	4
Horn Lane (NB)	479	83	6	480	83	6	495	86	6

Hanger Lane Gyratory (Northwest corner)

6.8.94 Table 6-302 below shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-302: Construction impacts at Hanger Lane Gyratory (Northwest corner) (signals)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Hanger Lane	1349	88	19	1349	88	19	1351	88	19
Roundabout (NB)	4753	52	17	4747	52	17	4759	52	17
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Hanger Lane	1216	73	17	1217	73	17	1218	73	17
Roundabout (NB)	4813	53	18	4788	53	18	4823	53	18

Hanger Lane / Westgate

6.8.95 Table 6-303 shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-303: Construction impacts at Hanger Lane / Westgate (signals)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Hanger Lane (SB)	1329	43	5	1329	43	5	1331	43	5
Hanger Lane (NB)	934	35	3	934	35	3	929	34	3
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Hanger Lane (SB)	1196	37	6	1197	37	6	1198	37	6
Hanger Lane (NB)	1138	40	5	1105	39	5	1108	39	5

Ealing Road / Hanger Lane / Alperton Lane

6.8.96 Table 6-304 shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-304: Construction impacts at Ealing Road / Hanger Lane / Alperton Lane (priority junction)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Ealing Road	1100	30	0	1099	30	0	1101	30	0
Hanger Lane	934	47	0	934	47	0	929	47	0
Alperton Lane	369	35	1	369	35	1	370	35	1
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Ealing Road	849	28	0	848	28	0	850	28	0
Hanger Lane	1138	57	0	1105	55	0	1108	55	0
Alperton Lane	266	29	3	266	29	2	265	29	2

Greenford Road / Rockware Avenue

6.8.97 Table 6-305 shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. While this junction already operates close to (AM) and beyond (PM) capacity, it can be seen that the impacts of construction of HS2 on this junction are negligible.

Table 6-305: Construction impacts at Greenford Road / Rockware Avenue (signals)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Greenford Road (SB)	530	65	6	531	65	6	531	65	6
Greenford Road (NB)	907	90	12	908	90	12	909	90	12
Rockware Avenue	65	62	6	67	62	6	65	62	6
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Greenford Road (SB)	486	76	6	493	77	6	488	76	6
Greenford Road (NB)	1033	104	13	1036	104	13	1039	104	13
Rockware Avenue	101	63	7	100	63	7	102	63	7

Church Road / Western Avenue (Target Roundabout)

6.8.98 Table 6-306 shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-306: Construction impacts at Church Road / Western Avenue (Target Roundabout) (signals)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Church Road	1056	26	0	1053	26	0	1053	26	0
Target Roundabout (EB)	1197	29	0	1205	29	0	1204	29	0
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Church Road	536	13	0	538	13	0	535	13	0
Target Roundabout (EB)	1551	37	0	1550	37	0	1547	36	0

Mandeville Road / Eastcote Lane

6.8.99 Table 6-307 shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. While this junction already operates beyond capacity, it can be seen that the impacts of construction of HS2 on this junction are negligible.

Table 6-307: Construction impacts at Mandeville Road / Eastcote Lane (priority junction)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mandeville Road (SB)	868	90	9	868	90	9	868	90	9
Mandeville Road (NB)	1223	96	15	1232	97	15	1231	97	15
Eastcote Lane	548	99	12	549	99	12	548	99	12
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mandeville Road (SB)	847	77	7	851	77	7	851	77	7
Mandeville Road (NB)	1528	103	15	1532	103	15	1529	103	15
Eastcote Lane	394	91	9	395	91	9	392	91	9

Pett's Hill / Wood End Road / Mandeville Road

6.8.100 Table 6-308 shows the performance of the junction under two construction scenarios alongside the 2021 future baseline case. It can be seen that the impacts on this junction are relatively small.

Table 6-308: Construction impacts at Pett's Hill / Wood End Road / Mandeville Road (priority junction)

CFA5	2021 future baseline			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Pett's Hill	344	17	0	345	17	0	344	17	0

Wood End Lane	333	32	0	333	32	0	334	32	0
Mandeville Road	784	44	0	781	44	0	782	44	0
	2021 future baseline			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Pett's Hill	378	19	0	382	19	0	384	19	0
Wood End Lane	396	38	0	398	39	0	395	38	0
Mandeville Road	840	45	0	840	45	0	831	44	0

Parking and loading

- 6.8.101 There are no locations where a loss of car parking or loading on roads in the area is expected.

Accidents and safety

- 6.8.102 The accident data for the 36 month period from April 2009 to March 2012 in the vicinity the CFA5 worksites revealed a few concentrations at or near the locations of proposed worksites, but the main cluster of accidents was along the A40 corridor to the south.
- 6.8.103 While the underlying risks of collisions should be unchanged near the worksites (due to minimal changes in traffic flow), a small residual risk of collisions during the construction period will remain due new construction vehicle movements into and out of the worksites.
- 6.8.104 All new site access and egress locations will be subject to a safety assessment as part of the design process and all vehicle movements into and out of the site are to be under banksman control as necessary.
- 6.8.105 There are no issues identified for the future baseline network operation as a result of changes to the highway network or travel demands and, therefore, accident and safety records for the future baseline assessment are assumed to be the same as those for the baseline assessment.

Buses and interchange

- 6.8.106 It is not expected that the construction of the Proposed Scheme will require bus route diversions or resulting delays to buses.
- 6.8.107 However, it is likely that the access to the construction compound at Mandeville Road will need to be widened to permit safe passage of vehicles and site compound operatives. As a consequence, it is likely that short-term temporary relocation of southbound bus stop B on the eastern side of Mandeville Road will be required. It is expected that once the widening works are complete, the bus stop will be reinstated with only minor local adjustments to accommodate the new layout. The works are anticipated to take less than four weeks, with very limited impact on interchange.

Pedestrians and cyclists

- 6.8.108 In terms of vulnerable road user delays, the Proposed Scheme will not give rise to any delays to vulnerable road users on roads in the area. No PRoW or cycle diversions are anticipated and only very limited pedestrian diversions will be required (at most involving crossing to the opposite footway).

Mitigation of impacts

- 6.8.109 Because the impacts have been assessed to be only very limited within CFA5, no specific mitigation is considered necessary.

Northolt Corridor (CFA5) Proposed Scheme operation description

- 6.8.110 The shaft sites will be used for operational purposes, but this will be limited to relatively minor maintenance activities. The operational impact on the transport network will therefore be minimal with few HGV movements per week even for maintenance. At this level there are no transport impacts. Additionally, there are no permanent traffic or PRoW diversions.
- 6.8.111 However, there are potential operational impacts arising from the new HS2 station at Old Oak Common within CFA4.
- 6.8.112 The demand generated by operation of Old Oak Common Station is described in the section on CFA4.

Northolt Corridor (CFA5) operation impacts

Key operation transport Issues

- 6.8.113 Traffic generated by the operation of Old Oak Common Station leads to some substantial changes on links and the junctions between them. These are set out below.

Strategic and local road network traffic flows 2026

- 6.8.114 The results of the highway assignment using the above flows added to the overall background flows in WELHAM for the 2026 operational scenario AM and PM peak hour are shown in Table 6-309 and Table 6-310. They show only very small changes in flows.

Table 6-309: WeLHAM highway assignment CFA5 AM 2026 operation

WeLHAM AM Flows (Vehicles)	Direction	Future Baseline 2026		2026 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
CFA5									
Coronation Road	EB	238	14	239	15	0	1	0%	6%
	WB	34	10	34	10	0	0	0%	0%
Connell Crescent bridge	EB	370	8	373	8	3	1	1%	8%
	WB	15	0	15	0	0	0	2%	0%
Hanger Lane East Bridge	SB	5055	304	5067	304	12	0	0%	0%
Hanger Lane West Bridge	NB	4639	237	4665	236	25	-1	1%	0%

WeLHAM AM Flows (Vehicles)	Direction	Future Baseline 2026		2026 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
Alperton Lane	NB	551	1	552	1	0	0	0%	1%
	SB	382	37	382	37	0	0	0%	-1%
Bideford Avenue	NB	311	10	310	10	0	0	0%	0%
	SB	422	26	423	26	1	0	0%	0%
Horsenden Lane	NB	249	8	248	8	-1	0	0%	0%
	SB	257	24	256	24	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	417	16	420	16	3	0	1%	-1%
	SB	548	8	548	8	0	0	0%	-1%
Greenford Road (south of Uneeda Drive)	NB	823	83	825	83	1	0	0%	0%
	SB	856	65	855	65	-1	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	344	19	342	19	-2	0	-1%	0%
	SB	627	24	626	24	-1	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1244	41	1245	41	1	0	0%	0%
	SB	831	35	832	35	1	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1166	59	1168	59	2	0	0%	0%
	SB	999	51	1001	51	2	0	0%	0%
Eastcote Lane	EB	655	14	655	14	0	0	0%	0%
	WB	342	12	342	12	1	0	0%	1%

Table 6-310: WelHAM highway assignment CFA5 PM 2026 operation

WELHAM Screenline Analysis	Direction	Future Baseline 2026		2026 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
WeLHAM PM Flows (Vehicles)									
CFA5									
Coronation Road	EB	128	11	140	12	13	1	10%	13%
	WB	65	10	66	10	0	0	0%	0%
Connell Crescent bridge	EB	140	3	152	5	12	1	9%	44%
	WB	45	0	45	0	0	0	0%	0%
Hanger Lane East Bridge	SB	4746	145	4816	144	69	-1	1%	-1%
Hanger Lane West Bridge	NB	4832	148	4893	147	61	-1	1%	-1%
Alperton Lane	NB	400	0	397	0	-3	0	-1%	2%
	SB	318	2	321	2	3	0	1%	0%
Bideford Avenue	NB	234	8	234	8	0	0	0%	-3%
	SB	682	24	681	24	-1	0	0%	0%
Horsenden Lane	NB	321	13	318	13	-4	-1	-1%	-5%
	SB	297	8	297	8	0	0	0%	-1%
Greenford Road (north of Uneeda Drive)	NB	517	2	517	2	0	0	0%	-3%
	SB	499	2	504	2	4	0	1%	-3%
Greenford Road (south of Uneeda Drive)	NB	995	37	994	37	-2	0	0%	0%
	SB	948	40	952	40	4	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	618	17	612	17	-6	0	-1%	0%
	SB	484	13	482	13	-2	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1183	26	1185	26	2	0	0%	0%
	SB	830	21	822	21	-7	0	-1%	0%
Mandeville Road (south of Eastcote Lane)	NB	1473	32	1473	32	0	0	0%	0%
	SB	506	33	500	33	-6	0	-1%	0%
Eastcote Lane	EB	635	8	634	8	-1	0	0%	0%
	WB	490	10	490	10	0	0	0%	0%

- 6.8.115 In the AM period there is a slight increase in flows on Leamington Park and Horn Lane to the north of Leamington Park, and Friary Road.
- 6.8.116 The PM period shows a similar pattern to the AM but with lower flow increases.
- 6.8.117 Increases in traffic as a result of the Proposed Scheme are almost entirely access trips to and from Old Oak Common station. Although occasional traffic may access areas of the Proposed Scheme for maintenance and servicing purposes, these infrequent vehicle movements that will be very low.
- 6.8.118 In 2026, the impact of traffic accessing Old Oak Common station is primarily on local roads leading to and from the station with some onward movements on the strategic network.
- 6.8.119 The modelling of the Proposed Scheme shows significant increases in peak hour traffic flows of more than 10% in 2026 at the following location, potentially causing an increase in traffic-related severance for non-motorised users. N/A is used to indicate where the link will only experience a substantial increase for one traffic category (i.e. only general traffic).

Table 6-311: Links with substantial traffic increases in 2026

2026 Operation		Increase in General Traffic		Increase in HGVs	
CFA	Roads impacted by increase	PCU	%	PCU	%
5	Welland Gardens	59	11%	N/A	N/A

- 6.8.120 The congestion on the A40 leads the model to predict small increases in flow in locations these are unlikely to occur. In this instance Welland Gardens because the road network is such that it is unlikely to experience any impact.

Strategic and local road network traffic flows 2041

- 6.8.121 The results of the highway assignment for the 2041 Operational scenario AM and PM peak hour are shown in Table 6-312 and Table 6-313. They show only very small changes in flows.

Table 6-312: WeLHAM highway assignment CFA5 2041 AM operation

		Future Baseline 2041		2041 Operation with HS2					
WeLHAM AM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
CFA5									
Coronation Road	EB	255	15	257	15	1	0	0%	0%
	WB	36	10	36	10	0	0	0%	0%

		Future Baseline 2041		2041 Operation with HS2					
WeLHAM AM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
Connell Crescent bridge	EB	399	8	399	8	-1	0	0%	0%
	WB	15	0	13	0	-2	0	-12%	0%
Hanger Lane East Bridge	SB	5181	304	5219	305	38	2	1%	1%
Hanger Lane West Bridge	NB	4785	241	4809	242	25	1	1%	0%
Alperton Lane	NB	532	1	531	1	-2	0	0%	-1%
	SB	422	38	417	38	-5	-1	-1%	-1%
Bideford Avenue	NB	331	10	323	10	-8	0	-2%	-1%
	SB	443	26	440	26	-3	0	-1%	0%
Horsenden Lane	NB	244	8	242	8	-1	0	0%	0%
	SB	260	24	259	24	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	446	16	439	16	-7	0	-2%	0%
	SB	563	9	569	9	5	0	1%	-1%
Greenford Road (south of Uneeda Drive)	NB	857	80	856	80	-1	1	0%	1%
	SB	867	65	872	65	5	0	1%	0%
Oldfield Lane (north of Uneeda Drive)	NB	402	20	422	20	19	0	5%	0%
	SB	660	24	660	24	0	0	0%	1%
Mandeville Road (north of Eastcote Lane)	NB	1268	41	1264	41	-4	0	0%	0%
	SB	843	35	842	35	-1	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1226	58	1221	58	-4	0	0%	0%
	SB	1017	52	1014	52	-3	0	0%	0%
Eastcote Lane	EB	666	13	665	13	-1	0	0%	-1%
	WB	358	12	359	12	1	0	0%	0%

Table 6-313: WeLHAM highway assignment CFA5 2041 PM operation

WELHAM Screenline Analysis	Direction	Future Baseline 2041		2041 Operation with HS2					
		All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
WeLHAM PM Flows (Vehicles)									
CFA5									
Coronation Road	EB	136	12	162	12	26	0	19%	0%
	WB	67	10	67	10	0	0	0%	0%
Connell Crescent bridge	EB	147	5	173	5	26	0	17%	0%
	WB	47	0	47	0	0	0	0%	
Hanger Lane East Br.	SB	4867	146	4936	145	69	-1	1%	-1%
Hanger Lane West Br.	NB	5074	145	5125	147	51	1	1%	1%
Alperton Lane	NB	424	0	425	0	1	0	0%	3%
	SB	353	2	359	2	6	0	2%	2%
Bideford Avenue	NB	240	9	240	8	-1	-1	0%	-12%
	SB	691	24	686	24	-5	0	-1%	0%
Horsenden Lane	NB	334	14	328	14	-6	0	-2%	-2%
	SB	299	8	299	8	0	0	0%	4%
Greenford Road (north of Uneeda Drive)	NB	553	3	550	2	-3	0	-1%	-8%
	SB	508	3	509	2	1	0	0%	-5%
Greenford Road (south of Uneeda Drive)	NB	1021	37	1025	37	4	0	0%	0%
	SB	962	40	963	39	1	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	641	17	646	17	5	0	1%	1%
	SB	495	13	496	13	1	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1166	26	1166	26	0	0	0%	0%
	SB	827	20	826	20	0	0	0%	1%
Mandeville Road (south of Eastcote Lane)	NB	1447	35	1450	35	2	0	0%	1%
	SB	515	32	516	32	1	0	0%	1%
Eastcote Lane	EB	645	8	648	8	3	0	0%	0%
	WB	527	11	529	11	2	0	0%	0%

- 6.8.122 In the AM period there is a slight increase in flows on Leamington Park, Friary Road and Horn Lane as for the 2026 assessment year noted above.
- 6.8.123 The PM period shows a similar pattern to the AM, again with lower flow increases.
- 6.8.124 Impacts in the 2041 operational assessment are similar to those in the 2026 operational assessment. The modelling of the Proposed Scheme is expected to result in significant increases in peak hour traffic flows of more than 10% in 2041 at the following locations, potentially causing an increase in traffic-related severance for non-motorised users. N/A is used to indicate where the link will only experience a substantial increase for one traffic category (i.e. only HGV traffic).

Table 6-314: Summary of impacted links CFA5 2041 Operation (AM & PM average)

2041 Operation		Increase in General Traffic		Increase in HGVs	
CFA	Roads impacted by increase	PCU	%	PCU	%
5	Friary Road	N/A	N/A	6	33%
5	Friars Way	N/A	N/A	5	45%
5	St Dunstan's Avenue	N/A	N/A	5	45%

- 6.8.125 Congestion on the A40 leads the model to predict small increases in flow in locations these are unlikely to occur. In this instance Friars Way and St Dunstan's Avenue because the road network is such that they are unlikely to experience any impact.

Junction performance

- 6.8.126 Table 6-315 shows that the operation of the scheme leads to modest increases in traffic flow at this junction in the AM peak hour, with generally very small reductions in the PM peak. In the AM peak the flow increases lead to an increase in RFC. This is the only junction at which there is a material increase in congestion. This is also reported in CFA4 as it is a direct impact of the operation of Old Oak Common station.

Table 6-315: Forecast baseline performance at Horn Lane / Friary Road (signals)

CFA5	2026 Baseline			2041 Baseline			2026 Operation			2041 Operation		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	691	89	9	718	92	9	701	90	9	727	93	9
Friary Road (WB)	144	34	3	182	43	4	157	37	3	196	46	4
Horn Lane (NB)	763	89	10	759	90	10	763	90	10	763	91	10
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Horn Lane (SB)	384	95	4	391	96	4	383	94	4	389	95	4
Friary Road (WB)	323	75	4	336	77	5	326	75	4	333	77	4
Horn Lane (NB)	487	85	6	497	87	6	486	84	6	494	86	6

Other impacts

- 6.8.127 There are no locations within CFA5 at which the operation of HS2 is likely to have an adverse impact on any other road traffic user group (such as road safety, pedestrians, cyclists, etc.).

Public Transport

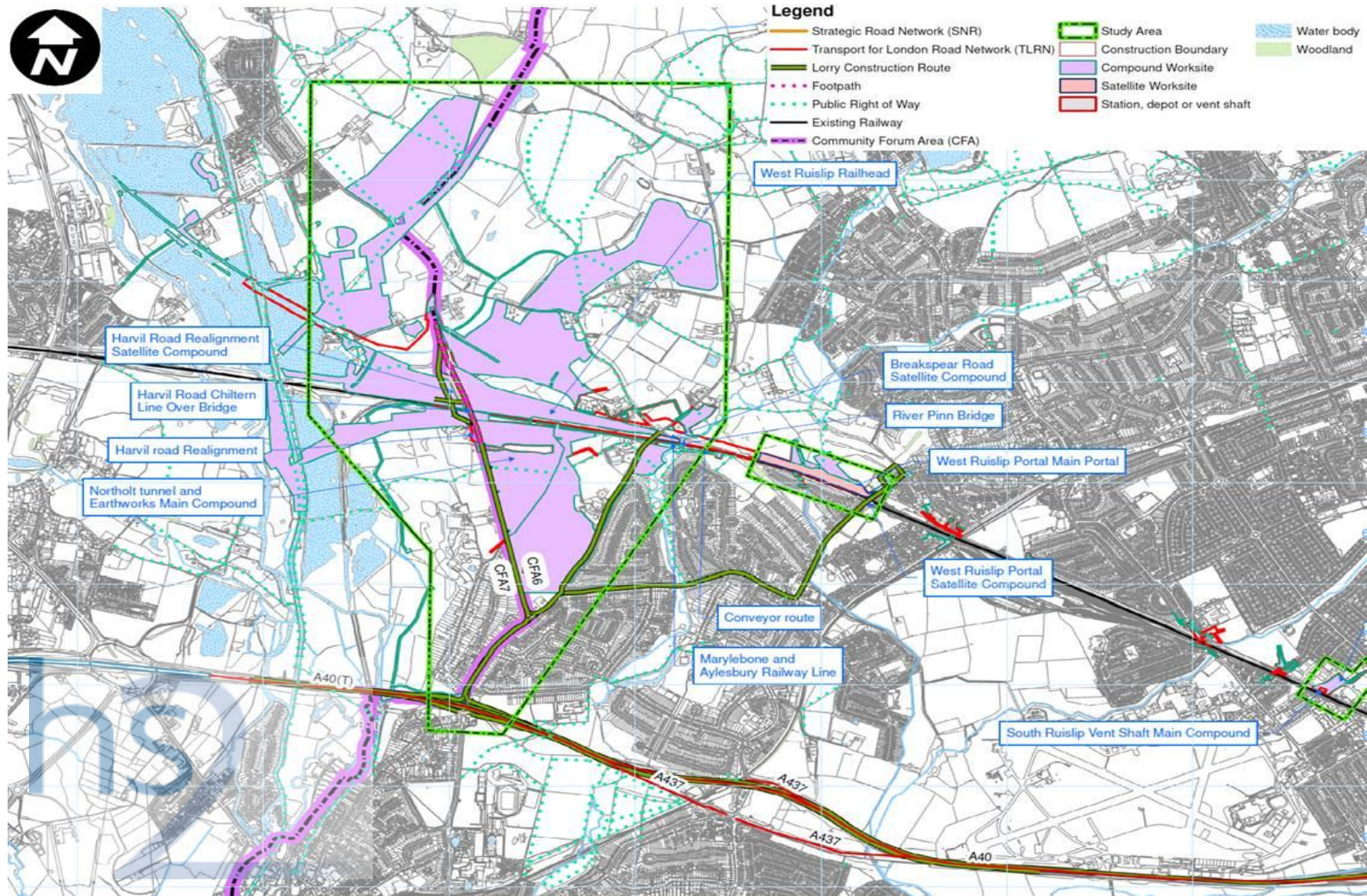
- 6.8.128 There are no operational impacts on public transport in CFA5, other than small potential impacts arising from the potential future rescheduling of buses as part of the change in operations to service Old Oak Common Station in CFA4. These are reported in the CFA4 operational section.

6.9 South Ruislip to Ickenham (CFA6)

South Ruislip to Ickenham (CFA6) Proposed Scheme description

- 6.9.1 South Ruislip to Ickenham (CFA6) is in West London and covers the London Borough of Hillingdon. CFA5 (Northolt Corridor) lies to the east, and CFA7 (Colne Valley) to the west.
- 6.9.2 The Proposed Scheme through this area will be approximately 6.7km in length, in the London Borough of Hillingdon. It will enter the area in tunnel at the boundary with Northolt Corridor (CFA5) directly south of Rabournmead Drive, South Ruislip. It will then continue north-west in tunnel for approximately 4.4km at an approximate depth of 30m below ground level. A ventilation and intervention shaft will be located at South Ruislip.
- 6.9.3 A tunnel portal will be constructed at West Ruislip, approximately 70m west of Ickenham Road. After gradually returning to the surface on a ramp within the portal structure, the route will be on embankment with bridges across the River Pinn and Breakspear Road South. West of Breakspear Road South the route will initially be on embankment and then in a large cutting, which will extend to the boundary with the Colne Valley area (CFA7) at Harvil Road, Ickenham. Temporary sidings to facilitate construction works and allow removal of excavated material from the tunnels in this area will be provided between Breakspear Road South and Harvil Road. These will be replaced by a permanent siding for maintenance equipment. Key features of the Proposed Scheme are shown in Figure 6-213.
- 6.9.4 Key permanent features of this section will comprise the Northolt Tunnel, the South Ruislip Shaft, the West Ruislip Portal, and two road crossing sites at Breakspear Road and Harvil Road. These features are shown on Maps CT-06-015 to CT-06-0019 (Volume 2, CFA6 Map Book) and are described in the following sections. CFA6 does not contain any HS2 stations.
- 6.9.5 The locations of the vent shaft and tunnel portal sites have been chosen to minimise the impact of construction. The works at each shaft site generates a relatively small flow of traffic, and their proximity to the main road network means that the traffic impact is negligible. Aside from minor issues such as the possible need for footway narrowing at sites, the construction will not require any closures or diversions.
- 6.9.6 The shaft sites will be used for operational purposes, but this will be limited to relatively minor maintenance activities. The operational impact on the transport network will therefore be minimal with not more than a few HGV movements per week even for maintenance. At this level there are no transport impacts.
- 6.9.7 In general, features are described from south to north along the route (and east to west for features that cross HS2). The location of the CFA6 sites relative to the strategic road network is shown in Figure 6-213, which also shows the connections from each of the sites to the strategic network.
- 6.9.8 It can be seen that worksites within CFA6 are generally located parallel to, and to the north of, the Western Avenue (A40). The A40 is on the Transport for London Road Network (TLRN). It extends from Westminster in Central London and becomes the M40 to the west, connecting to the M25 and other destinations to the north.

Figure 6-213: CFA6 wider area core road network, compounds and construction routes



- 6.9.9 Below is a brief description of each site covering the Northolt Tunnel (which lies mainly in the adjacent CFA5) and extending to Harvil Road, the north section of which lies in the adjacent CFA7 to the west.
- 6.9.10 Diversion of a number of PRow and bridleways will be required, mainly on a temporary basis during construction, but some will need to be permanently diverted. All impacted PRow will be described in subsequent sections.

Northolt Tunnel

- 6.9.11 The Northolt Tunnel is approximately 13.4km in overall length between Old Oak Common station and the West Ruislip portal, of which 4.4km lies within CFA6. The tunnel will start at the western end of the Victoria Road crossover box (located in CFA4). The Northolt Tunnel will then continue west, before terminating at the West Ruislip portal (see Maps CT-06-015 to CT-06-0019 (Volume 2, CFA6 Map Book).

South Ruislip shaft main site compound

- 6.9.12 This site is located in the London Borough of Hillingdon and it is proposed that a tunnel shaft be sunk on an area of vacant land located approximately 350m to the east of South Ruislip station. The site is on the northern side of the existing London Underground Central Line and Chiltern Railways mainline and is situated to the rear of a disused DIY superstore.
- 6.9.13 Access to the worksite is via a service delivery access road adjacent to the disused DIY store off Victoria Road. Victoria Road is a busy mixed use road.

West Ruislip Portal main site compound

- 6.9.14 The portal and approach ramp will consist of diaphragm walls forming an earth retaining box structure with an approximate length of 520m. It will require:
- re-routeing of the Ickenham Stream (canal feeder), on the north side of the ramp structure, westwards to the River Pinn;
 - re-routeing of a footbridge over the ramp structure; and
 - modifications to the existing railway adjacent to the portal.

Brakespear Road main site compound

- 6.9.15 This compound will be used for civil engineering works near Brakespear Road South where it is crossed by the Proposed Scheme. This compound will:
- support the construction of the bridge and embankment works for approximately eighteen months, starting in 2017;
 - not provide overnight worker accommodation; and
 - be accessed via the A40 Western Avenue, the B467 Swakeleys Road and Brakespear Road South (headroom 4.4 metres) .
- 6.9.16 Brakespear Road is currently used by HGV accessing commercial sites off New Years Green Lane, and this will be the principal designated route for HS2 construction vehicles accessing sites off Brakespear Road.

6.9.17 Diversions of a number of utilities will be required.

6.9.18 Diversion of the River Pinn will be required, and is described in later sections.

Harvil Road Realignment satellite compound and facilities

6.9.19 This compound will be used for civil engineering works for Harvil Road realignment. The compound will:

- be operational for approximately 5 years, starting in 2017;
- not provide overnight worker accommodation; and
- be accessed via the A40 Western Avenue, the B467 Swakeleys Road and Harvil Road.

6.9.20 Diversions of a number of utilities near Harvil Road will be required.

6.9.21 No diversions of water courses will be required.

South Ruislip to Ickenham (CFA6) assessment methodology

6.9.22 The regional assessment methodology is set out in the London Regional methodology. There is no deviation from the regional methodology for this CFA.

South Ruislip to Ickenham (CFA6) future baseline operation

Key future baseline transport issues

6.9.23 There are no substantive issues for the future baseline. Land use and transport changes affecting this CFA are modest. However the completion of Crossrail 1 in 2018 will greatly improve public transport connectivity.

Land use and transport growth assumptions

6.9.24 The future baseline demand has been developed within the Railplan public transport passenger demand models and WeLHAM highway models, taking account of forecasts for changes to population, employment and traffic growth.

6.9.25 WeLHAM model for the area, background rail passenger demand in the area is forecast to increase, partially as a result of Crossrail and other schemes becoming operational. There is expected to be only limited background growth in bus passenger numbers other than that arising from Crossrail.

6.9.26 Individual construction activities have been assessed against 2021 baseline traffic flows, irrespective of when they occur during the construction period. Future baseline traffic volumes in the peak hours are forecast to grow by 2.5-3% by 2021 in this area, compared to 2012.

6.9.27 Future baseline traffic volumes in the peak hours are forecast to grow by 4.5-5.5% by 2026 compared to 2012.

6.9.28 Future baseline traffic volumes in the peak hours are forecast to grow by 8.5-9.5 % by 2041 compared to 2012.

Transport supply assumptions

- 6.9.29 No major changes to the highway network are planned. The forecast future baseline traffic volumes have been incorporated within TfL WeLHAM models for the future construction and operational years and include allowance for planned growth and major developments with planning consent. No other changes to the traffic and transport baseline are anticipated in the study area.
- 6.9.30 Crossrail will involve relatively minor highway works in the vicinity of the stations to improve pedestrian access. Given the existing public transport options in the area, the impact is likely to be limited to increased pedestrian movements at the stations
- 6.9.31 Crossrail may give rise to amendments to the bus network in the proximity of stations it serves, the closest to the Proposed Scheme stations being Acton mainline.
- 6.9.32 As well as forecast background highway traffic growth incorporated within the preliminary

Strategic and local road network traffic flows

- 6.9.33 Traffic flows on strategic and local roads are set out in Table 6-316 and Table 6-317 for existing baseline (2012), construction baseline (2021), HS2 Phase One operation year baseline (2026), and HS2 Phase Two operation year baseline (2041). Forecasts for other years may be determined by extrapolation assuming linear growth. This shows growth on links that intercept the Proposed Scheme route corridor which is useful for comparative purposes. The tables also show one adjacent link in CFA5 for clarity.

Table 6-316: AM peak hour future baseline traffic flows on key strategic and local roads (demand flows)

		2012 Baseline		2021 Future Baseline		2026 Future Baseline		2041 Future Baseline		All Vehicles change from 2012			All Vehicle % change from 2012		
Location	Direction	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
CFA5															
Eastcote Lane	EB	659	13	651	13	655	14	666	13	-8	-4	7	-1%	-1%	1%
	WB	322	12	322	12	342	12	358	12	0	20	37	0%	6%	11%
CFA6															
West End Road	NB	699	55	685	43	674	30	686	29	-14	-25	-13	-2%	-4%	-2%
	SB	556	27	528	28	491	26	498	22	-28	-65	-58	-5%	-12%	-10%
Ickenham Road	NB	803	26	748	25	737	26	823	27	-55	-66	20	-7%	-8%	2%
	SB	1163	86	1122	72	1146	63	1183	71	-41	-16	21	-4%	-1%	2%
Breakspear Road	NB	542	14	561	14	553	14	516	14	19	11	-26	3%	2%	-5%
	SB	670	16	669	18	667	18	701	19	-1	-3	30	0%	0%	5%

		2012 Baseline		2021 Future Baseline		2026 Future Baseline		2041 Future Baseline		All Vehicles change from 2012			All Vehicle % change from 2012		
Location	Direction	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
Harvil Road	NB	332	22	335	22	336	19	340	19	4	4	9	1%	1%	3%
	SB	440	17	471	16	509	17	466	17	30	69	26	7%	16%	6%
Swakeleys Road (south)	NB	1663	89	1642	89	1619	87	1689	88	-22	-44	26	-1%	-3%	2%
	SB	1577	136	1574	123	1626	114	1649	119	-3	49	72	0%	3%	5%

6.9.34 Within CFA6 it can be seen that absolute flow changes are typically relatively small and these are generally reflected in small percentage changes. The variability in the numbers is a reflection of the modelled impact of congestion.

6.9.35 The highest percentage increase (from 2012 to 2041) in one-way flow is southbound on Swakeleys Road with an additional 72 vehicles which equates to an increase of 5%. Higher percentage increases result from lower flow changes based on lower base flows.

Table 6-317: PM peak hour future baseline traffic flows on key strategic and local roads (demand flows)

		2012 Baseline		2021 Future Baseline		2026 Future Baseline		2041 Future Baseline		All Vehicles change from 2012			All Vehicle % change from 2012		
Location	Direction	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
CFA5															
Eastcote Lane	EB	669	9	634	8	635	8	645	8	-35	-34	-24	-5%	-5%	-4%
	WB	489	10	459	10	490	10	527	11	-31	0	37	-6%	0%	8%
CFA6															
West End Road	NB	915	10	872	10	870	11	898	10	-43	-44	-16	-5%	-5%	-2%
	SB	630	10	620	10	616	10	620	10	-10	-14	-10	-2%	-2%	-2%
Ickenham Road	NB	1108	23	1087	23	1100	23	1125	24	-22	-8	17	-2%	-1%	2%
	SB	955	21	944	21	912	21	949	22	-12	-43	-7	-1%	-5%	-1%
Breakspear Road	NB	755	8	754	8	768	8	750	9	-1	12	-6	0%	2%	-1%
	SB	482	9	490	10	544	10	601	12	8	62	119	2%	13%	25%

		2012 Baseline		2021 Future Baseline		2026 Future Baseline		2041 Future Baseline		All Vehicles change from 2012			All Vehicle % change from 2012		
Location	Direction	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	All Vehicles	HGV & Buses	Change 2012-2021	Change 2012-2026	Change 2012-2041	Change 2012-2021 %	Change 2012-2026 %	Change 2012-2041 %
Harvil Road	NB	378	16	387	16	387	16	460	16	9	9	81	2%	2%	21%
	SB	440	9	428	9	449	9	488	9	-12	9	48	-3%	2%	11%
Swakeleys Road (south)	NB	1453	137	1455	137	1460	134	1509	135	2	7	56	0%	1%	4%
	SB	1343	79	1337	79	1377	75	1457	77	-6	35	115	0%	3%	9%

- 6.9.36 As for the AM peak hour, the table shows that flow changes in the PM peak hour are relatively small within this CFA, and these are generally reflected in small percentage changes. Where there are large percentage changes, these are still relatively small numbers but on a low base. The variability in the numbers is a reflection of the modelled impact of congestion.
- 6.9.37 The highest increase in one-way flow in CFA6 between 2012 and 2041 is on Breakspear Road which sees an increase of 119 vehicles per hour which equates to a 25% increase.

Junction performance

- 6.9.38 The operation of junctions in the proximity of the proposed interventions in the existing and future baseline is described and shown in the following paragraphs and tables.
- 6.9.39 It can be seen from these tables that the flow changes in CFA6 are relatively small.
- 6.9.40 The following tables examine the performance of individual junctions in the baseline and future baseline assessment years.

High Road, Ickenham / Long Lane / Swakeleys Road

- 6.9.41 Table 6-318 shows the impacts at this junction. The model shows that the junction operates within capacity during both AM and PM peak hours in all modelled periods. The relatively high flows would suggest that for peaks within the peak hour congestion could build up quickly.

Table 6-318: Forecast baseline performance at High Road, Ickenham / Long Lane / Swakeleys Road (priority junction)

CFA6	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
High Road, Ickenham	1148	43	0	1109	42	0	1115	42	0	1160	44	0
Long Lane	146	17	0	148	18	0	125	16	0	116	16	0
Swakeleys Road	642	58	1	589	54	1	571	52	1	653	59	1

	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
High Road, Ickenham	888	42	4	874	41	4	841	41	3	875	43	3
Long Lane	812	52	0	809	52	0	844	54	0	869	56	0
Swakeleys Road	156	53	1	150	51	1	126	49	1	123	52	2

Breakspear Road / Swakeleys Road

6.9.42 Table 6-319 shows the impacts at this junction. The model shows that the Breakspear Road arm operates close to or above its practical capacity during the AM peak hour. All other arms, and the whole junction in the PM peak hour, operate within practical capacity.

Table 6-319: Forecast baseline performance at Breakspear Road / Swakeleys Road (roundabout)

CFA6	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Breakspear Road	686	87	1	687	84	1	686	82	1	719	91	2
Swakeleys Road (WB)	305	48	0	299	48	0	247	42	0	258	44	0
Swakeleys Road (EB)	1197	71	0	1176	70	0	1139	66	0	1198	69	0
	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Breakspear Road	491	49	0	499	49	0	554	55	0	614	60	0
Swakeleys Road (WB)	329	48	0	331	49	0	304	47	0	295	48	0
Swakeleys Road (EB)	980	58	0	978	57	0	973	57	0	954	56	0

Harvil Road / Swakeleys Road

6.9.43 Table 6-320 shows the impacts at this junction. The model shows that the junction operates over its practical capacity in the AM peak hour in all modelled scenarios. In the PM peak hour the Swakeleys Road westbound arm is just below practical capacity in 2012 and 2021, which it exceeds due to general traffic growth in 2026 and 2041.

Table 6-320: Forecast baseline performance at Harvil Road / Swakeleys Road (roundabout)

CFA6	2012			2021			2026			2041		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Harvil Road	457	105	8	487	104	8	526	104	8	483	105	8
Swakeleys Road (WB)	983	105	8	997	106	8	925	105	8	960	105	8
Swakeleys Road (EB)	1475	96	0	1449	94	0	1422	91	0	1485	94	0

	2012			2021			2026			2041		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Harvil Road	449	67	1	436	65	1	458	68	1	496	71	1
Swakeleys Road (WB)	889	88	1	899	88	1	928	92	2	978	100	6
Swakeleys Road (EB)	1217	81	0	1216	81	0	1208	81	0	1254	84	0

Accidents and safety

- 6.9.44 Collision data for the 36 month period from April 2009 to March 2012 in the vicinity the CFA6 worksites revealed no substantial clusters at or near the locations of proposed worksites.
- 6.9.45 There are no issues identified for the future baseline network operation as a result of changes to the highway network or travel demands and, therefore, accident and safety records for the future baseline assessment are assumed to be the same as those for the baseline assessment.

Rail

- 6.9.46 The area is unlikely to be affected other than by the introduction of Crossrail services, which will have a minimal effect on station entry and exit flows in this CFA. The closest Crossrail station will be Hayes & Harlington.

South Ruislip to Ickenham (CFA6) Proposed Scheme construction description

Construction activities

- 6.9.47 The temporary traffic and transport impacts within this CFA are due to construction vehicle movements to/from the two main compounds and two satellite compounds. These movements include the delivery of plant and materials, movement of excavated materials and construction compound worker trips
- 6.9.48 The construction period for the whole route is programmed for 2017 to 2026. The base year for assessment of construction impacts has been chosen at 2021. The forecast peak construction activities have then been overlaid on 2021, with, as relevant, overlapping activities (in both area of importance and timing) considered in combination.
- 6.9.49 The main construction works and the time periods when each compound is operational are summarised in Figure 6-214.

Figure 6-214: South Ruislip to Ickenham (CFA6) construction activity phasing

Construction activity	2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				2026				2027			
	quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Advance works																																																
Advance works																																																
Civil engineering works																																																
South Ruislip vent shaft main compound																																																
South Ruislip vent shaft																																																
South Ruislip auto-transformer station																																																
West Ruislip portal satellite compound																																																
West Ruislip portal																																																
Ickenham Stream (canal feeder) underbridge																																																
Northolt tunnel																																																
West Ruislip retained embankment																																																
Breakspear Road South satellite compound																																																
West Ruislip retained embankment																																																
Gatemead embankment																																																
Brackenbury cutting																																																
Copthall retaining structure																																																
River Pinn underbridge																																																
Breakspear Road South underbridge																																																
Harvil Road realignment satellite compound																																																
Copthall cutting																																																

[illegible]

Construction activity	2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				2026				2027			
	quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters				quarters			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
tunnel																																																
Railway installation works within open route																																																
Commissioning																																																
Testing and commissioning of the railway																																																

6.9.50 Works in the Brakespear Road section of the Proposed Scheme will be carried out in the following broad phases:

- construction of a new access road into the pharmaceutical research facility and diversion of all associated utilities and realignment of PRoW U42;
- formation of new site access roads off Breakspear Road South to the east and west;
- excavation and formation of River Pinn flood compensation area to the south of Dunster Cottage, followed by reinstatement of PRoW U43;
- construction of bridges over Breakspear Road South and the River Pinn;
- formation of embankments either side of the River Pinn bridge and Breakspear Road South bridge with access from Breakspear Road South including embankment for temporary railhead link to Chiltern Main Line; and
- construction of a temporary narrow gauge railway, conveyor and service road for the Northolt tunnel construction works.

6.9.51 Works in the Harvil Road section of the Proposed Scheme will be carried out in the following broad phases:

- formation of new site access roads off Harvil Road;
- construction of three new bridges for the realigned Harvil Road;
- construction of new embankment supporting Harvil Road;
- diversion of major utilities into the new Harvil Road alignment;
- construction of earthworks 700m in length, Brackenbury cutting and landscape earthworks with access from Harvil Road and Breakspear Road South;
- access for passive provision works on the Heathrow Spur East Chord; and
- demolition of the existing Harvil Road bridge over the Chiltern Main Line to accommodate temporary railhead link.

Compounds and construction sites

6.9.52 The compounds and construction sites are described in Volume 2 Chapter 2.3. This information, including numbers of workers at each site, is summarised in Table 6-321.

Table 6-321: CFA6 Worksite compound details (also showing workers and staff)

Type	Location	(Chainage)	Principal use (TBC)	No of workers	No of staff
Main site compound and facilities	South Ruislip Shaft	020+700	South Ruislip Shaft & South Ruislip ATS	31	15
Satellite compound and facilities	West Ruislip Portal	023+500	West Ruislip Portal	50	13
Satellite compound and facilities	Breakspear Road	024+600	West Ruislip retained Enbankment, River Pinn Underbridge, Breakspear Road South Underbridge, Brackenbury & Copthall cuttings & Copthall Retained Structure	207	69
Railhead	West Ruislip Rail head	025-600	Main facility for handling of bulk materials .		
Satellite compound and facilities	Harvil Road Realignment	025+900	Harvil Road Overbridge, Harvil Road steam bridge, Harvil Road over Chiltern Lines & Ickenham ATFS	198	51
Main site compound and facilities	Northolt Tunnel and Earthworks	025+800			

6.9.53 The timing and duration of busy transport activity at each construction compound is shown in Table 6-322. This represents the periods when the construction traffic flows will be greater than 50% of the peak flows. Also shown is the estimated number of daily vehicle trips during the peak month of activity, the lower end of the range shows the average number of trips and the upper end the peak flows. The assessment scenario has assumed the peak month for the combination of activities, i.e. not necessarily the peak activity at each individual site.

6.9.54 The average construction traffic levels for the peak month have been assessed. Typical activity will be lower than that shown in Table 6-322.

Table 6-322: South Ruislip to Ickenham (CFA6) typical vehicle trip generation for construction compounds

Compound type	Location	Access	Indicative start / set up date	Estimated duration of use (years)	Estimated duration with busy vehicle movements (Years)	Typical daily number of combined two way trips	
						Cars/ LGVs	HGVs
Main compound and facilities	South Ruislip shaft	Victoria Road	2018	7 years	2 years	10-20	90-100
Main compound and facilities	Northolt tunnel and earthworks (including Gatemead embankment works)	Harvil Road	2017	10 years	1 year	102 - 136	1,020 -1,360
Satellite compound and facilities	Breakspear Road (including West Ruislip embankment works)	Breakspear Road South	2017	5 years	6 months	15-20	150 - 200
Satellite compound and facilities	Harvil Road realignment	Harvil Road	2017	5 years	1 year	8-10	75-100
Satellite compound and facilities	West Ruislip portal	Ickenham Road / Hill Lane	2017	8 years	1 year 6 months	22-30	225 - 300

6.9.55 The following assumptions have been made when determining where HGVs will originate from:

- re-soiling and formwork activities will arrive from A40 and M25
- HGVs required for excavation and prop installation activities will arrive A40 & M25
- HGVs required for delivering concrete will originate from the on-site batching
- HGVs required for delivering steel will originate from A40/M25
- HGV's required for structural fill from CFA7

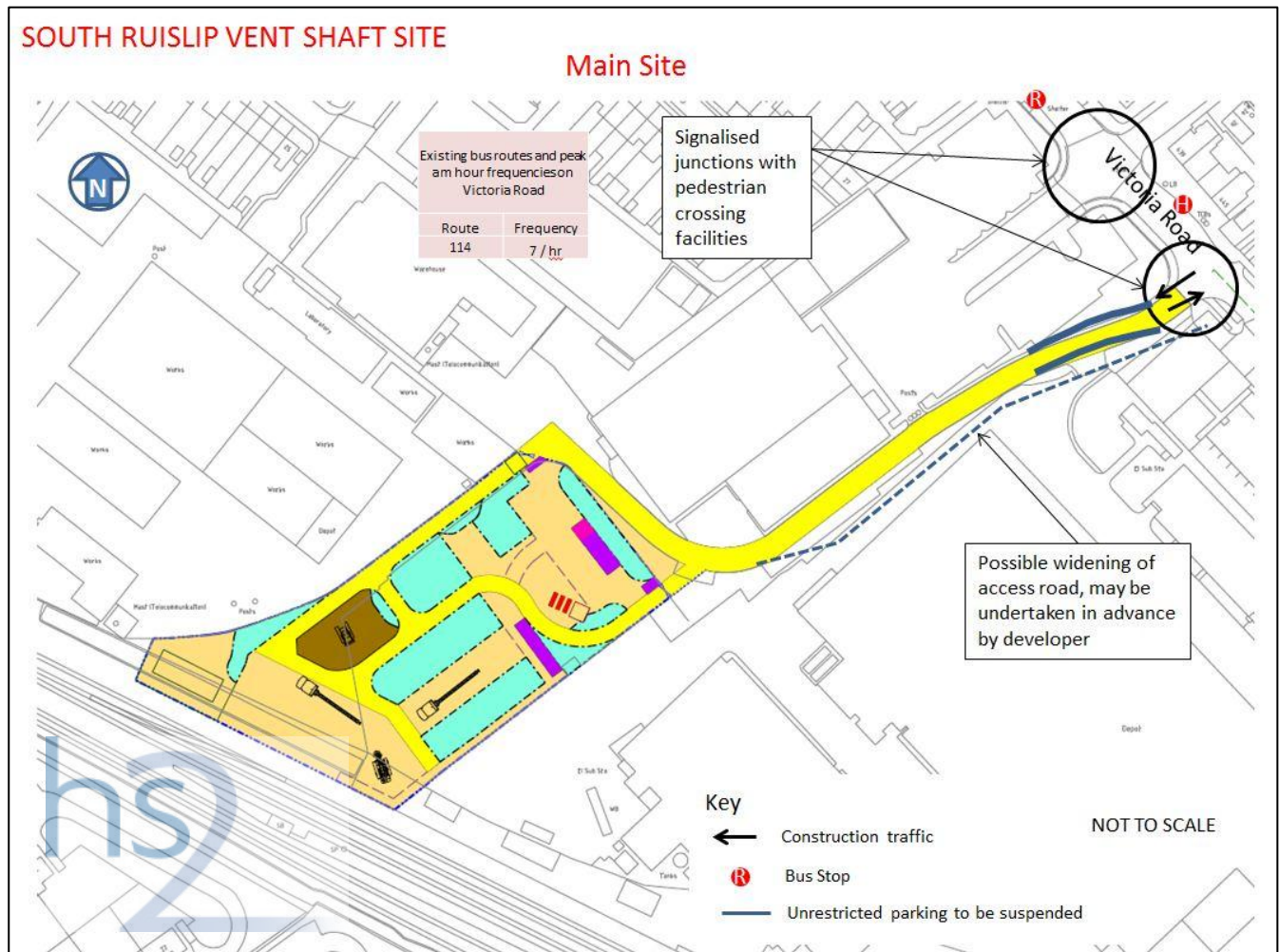
6.9.56 HGVs required for structural fill will originate from the Denham site (CFA7) via M25 and A40 with access to the M25 via new temporary north facing slip roads onto M25 J17 and to the A40/Swakeleys Road junction and Harvil Road.

6.9.57 Employees trips are minimal compared to prevailing flows (public transport and highway flows) and have therefore not been separately assigned. It is noted that existing employment and retail activities currently occupy many of the identified sites and therefore construction related trips will largely replace these existing uses. The Harvil Road worksites are the main exception to this, however the 24/7 construction means that the shift patterns of worker movements will be substantially less than the equivalent HGV movements considered as part of the construction assessment.

South Ruislip Shaft main compound (chainage 20700)

- 6.9.58 Figure 6-215 shows the main access and egress for this site along a short service road to the rear of a disused DIY superstore. It is narrow and may need to be widened to improve access for construction.

Figure 6-215: South Ruislip Shaft main compound and local access and egress

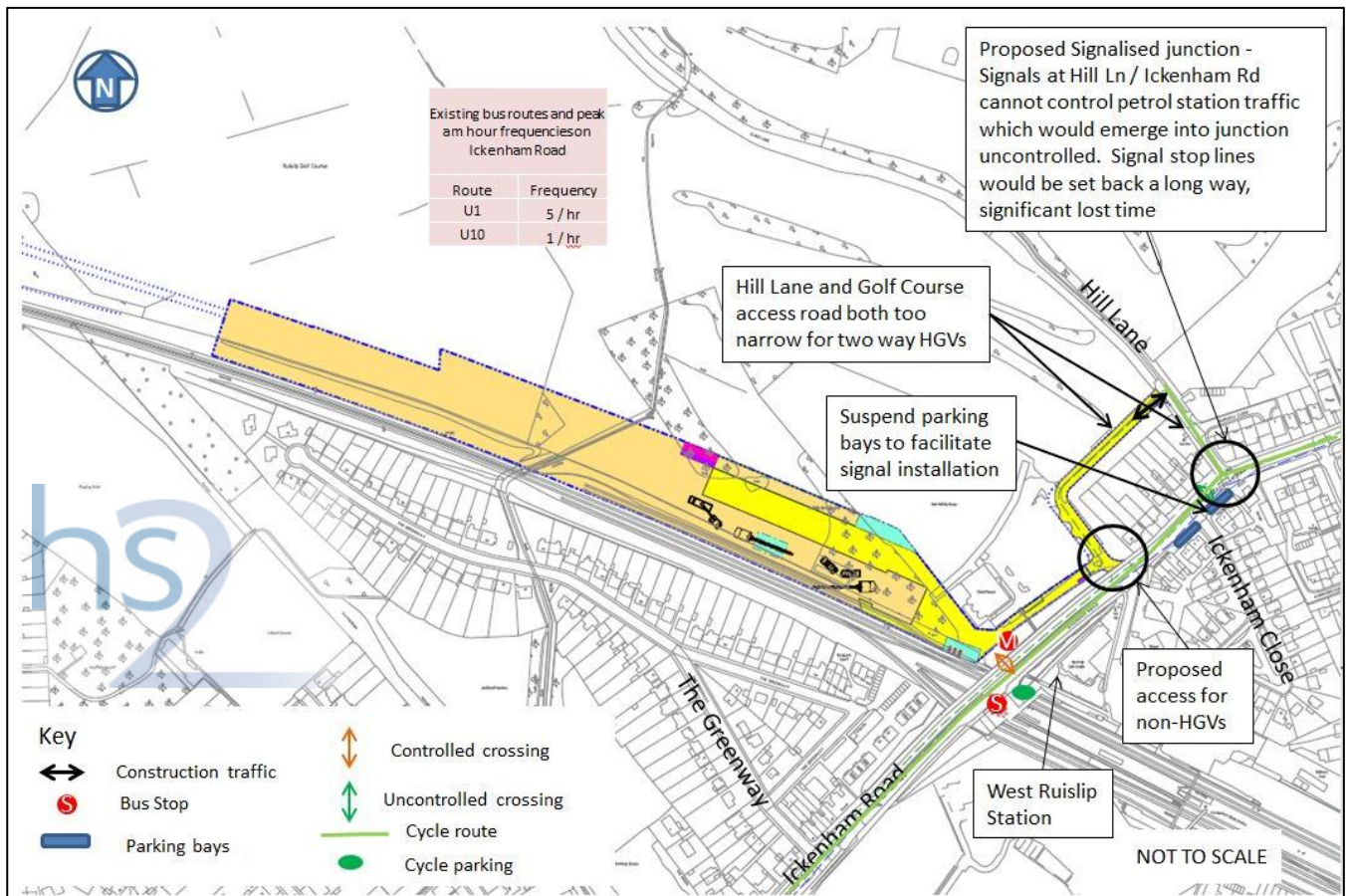


- 6.9.59 The construction route access for this worksite will be to leave the A40 Western Avenue at the Polish War memorial roundabout turning northbound onto the A4180 West End Road, right into Station Approach northeast-bound, left into Victoria Road and left into the industrial estate access road. The return journey will use the same route in the reverse direction.

West Ruislip Tunnel Portal main site compound (chainage 23500)

- 6.9.60 The construction route access for this main site from the A40 will be via the B467 Swakeleys Road northeast-bound, left into the B466 High Road Ickenham northbound, ahead onto the B466 Ickenham Road northeast-bound, left into Hill Lane and left into worksite. The return journey will use the same route in the reverse direction.

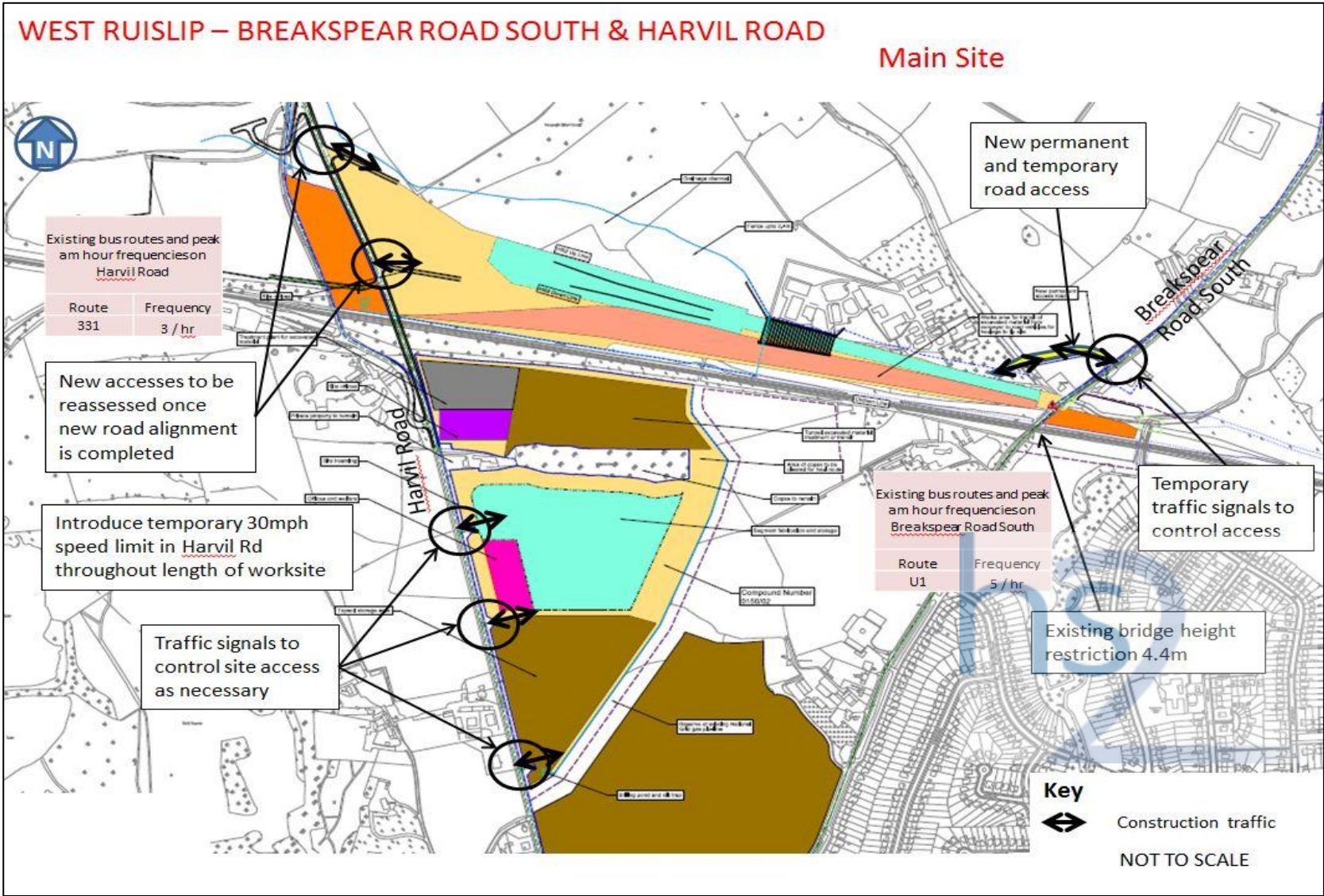
Figure 6-216: West Ruislip Tunnel Portal site and local access and egress



Breakspear Road satellite compound (chainage 24600)

- 6.9.61 Two construction traffic routes have been developed for this worksite, both of which avoid the existing low railway bridge over Breakspear Road South. The first route will be from the A40 Western Avenue onto the B467 Swakeleys Road northeast-bound, B466 High Road Ickenham northbound, B466 Ickenham Road northeast-bound, left into the A418 High Street northbound, Bury Street northwest-bound, and left into Breakspear Road southwest-bound. The return journey will use the same route in the reverse direction.
- 6.9.62 The second, shorter route can only be introduced when the Harvil Road worksite is in operation and can be used to feed traffic to Breakspear Road South site via a temporary lorry haul road parallel to the HS2 rail alignment. From the A40 Western Avenue, access will be via B467 Swakeleys Road northbound, left into Harvil Road and right into the Harvil Road worksite then eastbound towards the Breakspear Road South worksite via the temporary haul road. The return journey will use the same route in the reverse direction.

Figure 6-217: Breakspear Road satellite compound site and local access and egress



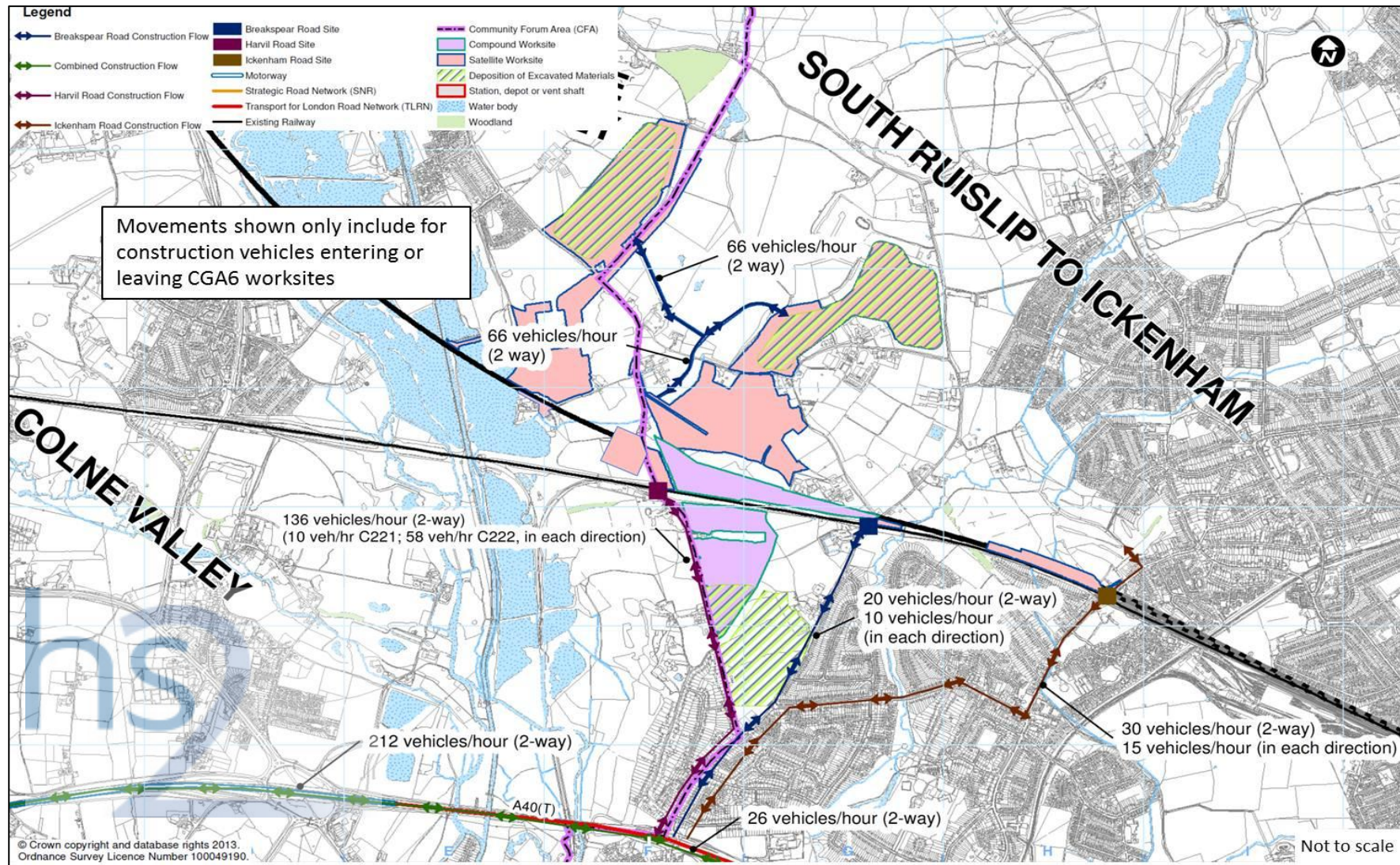
Harvil Road satellite site compound (chainage 25800)

- 6.9.63 The Harvil Road construction traffic route from the A40 Western Avenue will be northbound on the B467 Swakeleys Road, left onto Harvil Road and right into the site. The return journey will use the same route in the reverse direction.

Construction lorry routes and HGV movements

- 6.9.64 The final approach to the three worksites for construction lorry traffic in this CFA are shown in Figure 6-218.
- 6.9.65 Wherever possible, site access for construction traffic will adopt a left in – left out circulation principle to minimise disruption to traffic by avoiding right turns across existing traffic.

Figure 6-218: CFA6 Hs2 HGV route loadings (vehicles)



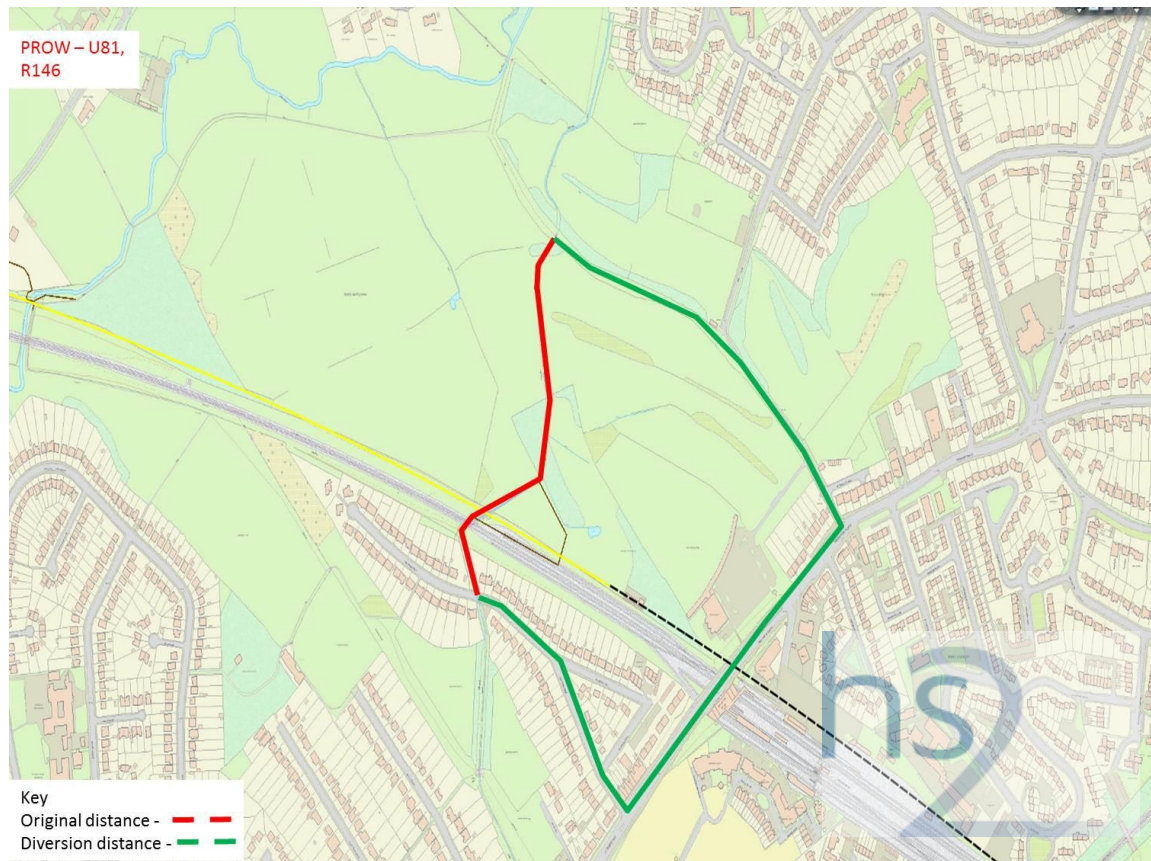
Traffic management, road closures and diversions

- 6.9.66 No traffic diversions or road closures are necessary, other than for the Harvil Road realignment, which will be built off-line to the east of the existing road, and then traffic transferred to the new alignment of Harvil Road over a long weekend (or similar duration).

PRoW closures and diversions

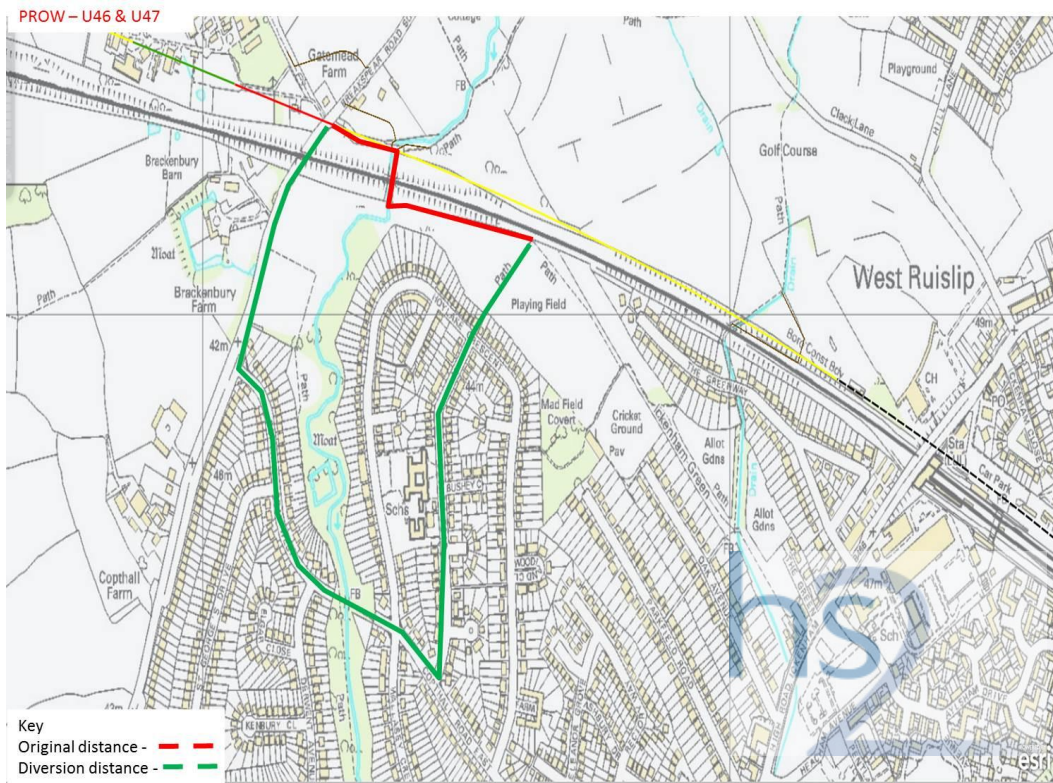
- 6.9.67 The proposed construction activities in West Ruislip area will result in disruption and diversions to a limited number of PRoW through and around the worksites resulting in increased journey distances and times. Local traffic management will be introduced during the construction period to minimise local diversionary effects on vulnerable road users while works are carried out. These are considered further in subsequent sections.
- 6.9.68 It will be necessary to temporarily close footpath U81 from north side of The Greenway via footpath R146 in Ruislip Golf Course to Clack Lane as shown in Figure 6-219. This path will be diverted via The Greenway, Ickenham Road, Hill Lane and on to Clack Lane.

Figure 6-219: Temporary PRoW diversion of footpath U81



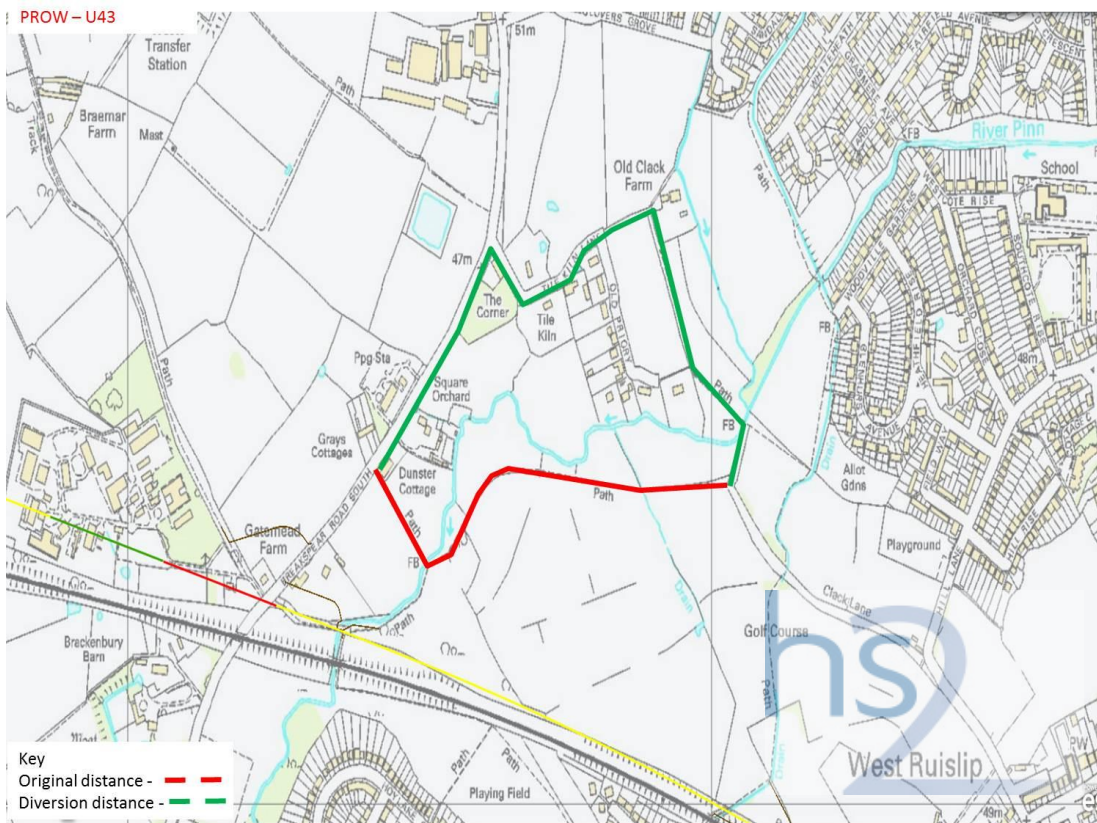
- 6.9.69 It will be necessary to temporarily close footpath U46 from the east side of Breakspear Road South connecting with footpath U47 to the north of Hoylake Crescent as shown in Figure 6-220. The diversion route is via Hoylake Crescent, Bushey Road, Copthal Road East and then on to Breakspear Road south.

Figure 6-220: Temporary PRoW diversion of footpath U46



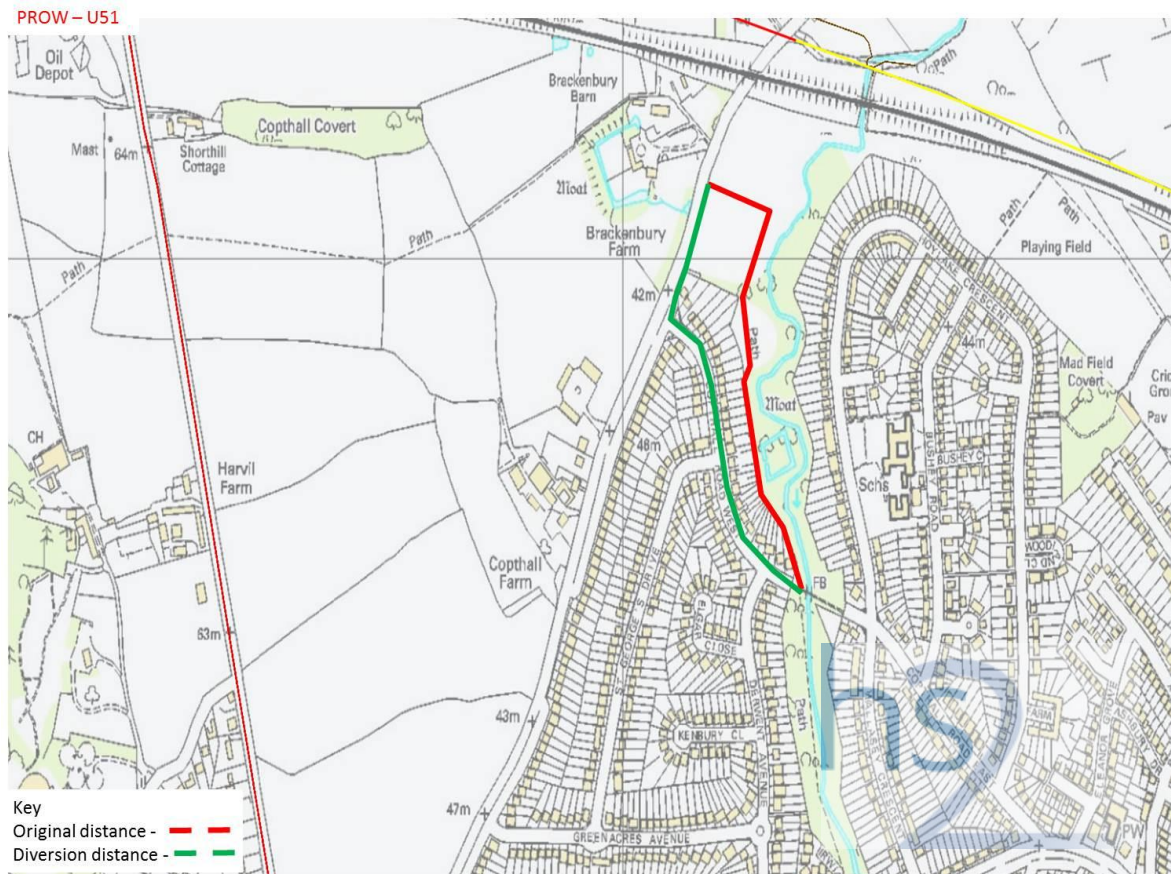
6.9.70 It will be necessary to temporarily close footpath U43 from the east side of Breakspear Road South connecting with footpaths U44 and U45 as shown in Figure 6-221. The diversion for this path is via Breakspear Road South, Tile Kiln Lane and then connects to Clack Lane via R183, R144.

Figure 6-221: Temporary PRoW diversion of footpath U43



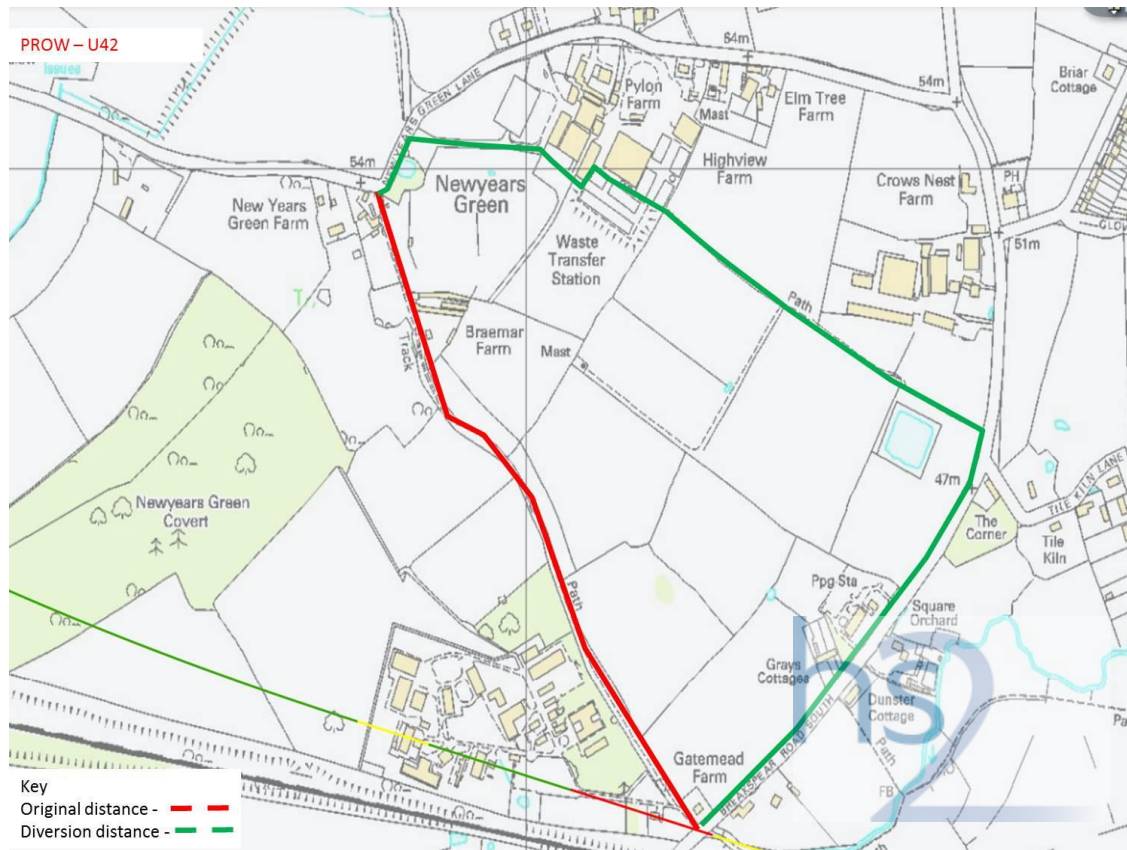
6.9.71 It will be necessary to temporarily close footpath U51 from east side of Breakspear Road South to Copthall Road West as shown in Figure 6-222. The diversion route is via Breakspear Road South and Copthall Road West.

Figure 6-222: Temporary PRoW diversion of footpath U51



6.9.72 It will be necessary to temporarily close bridleway U42 from west side of Breakspear Road South connecting to Newyears Green Lane as shown in Figure 6-223. The diversion route is via footpath 41 and Newyears Green Lane.

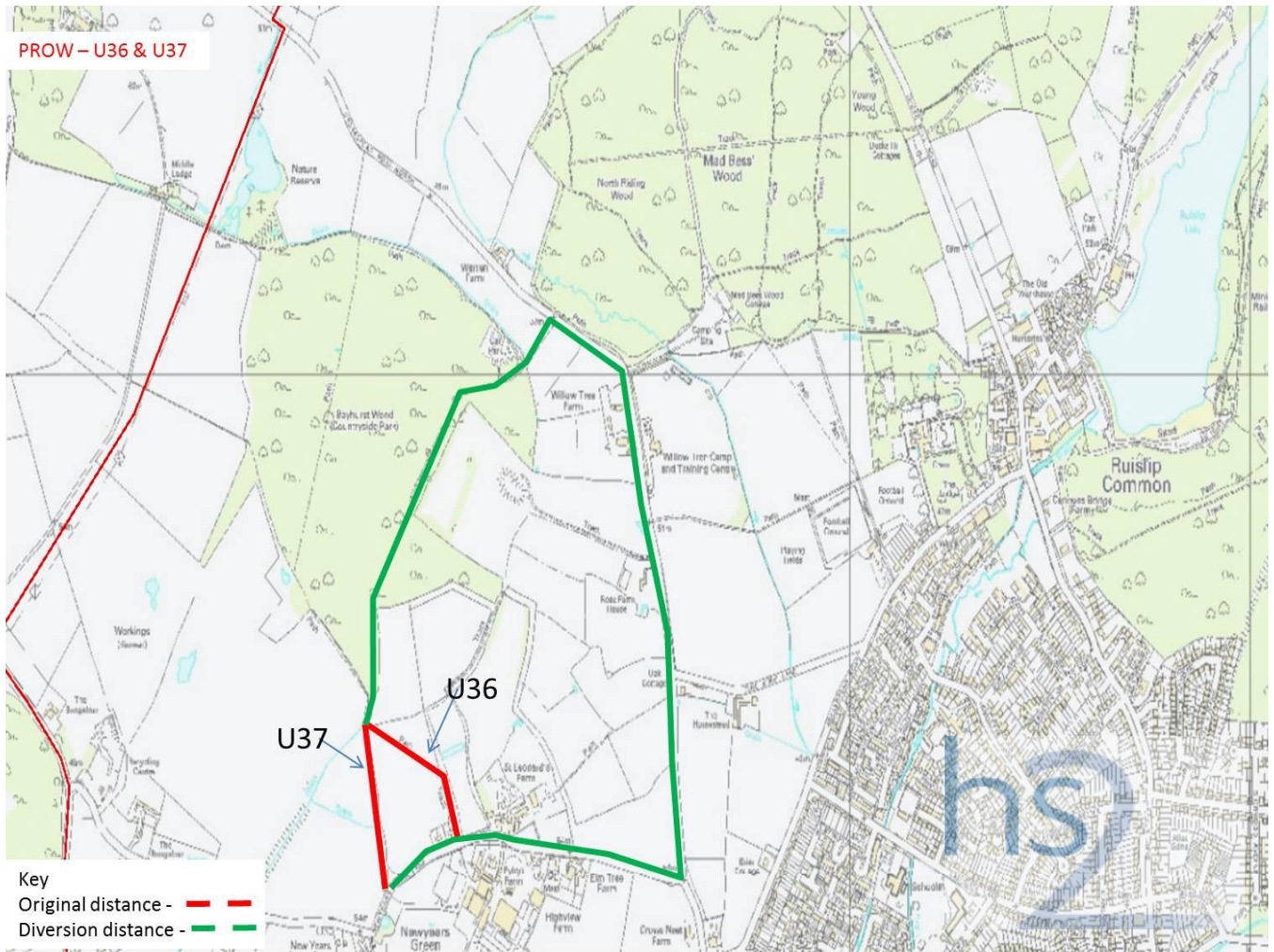
Figure 6-223: Temporary PROW diversion of bridleway U42



6.9.73 It will be necessary to temporarily close footpaths U36 and U37, from the north side of Newyears Green Lane connecting to the footpath U86. The diversion for these two footpaths is via Newyears Green Lane, Breakspear Road South, Breakspear Road North and footpath U86 as shown in

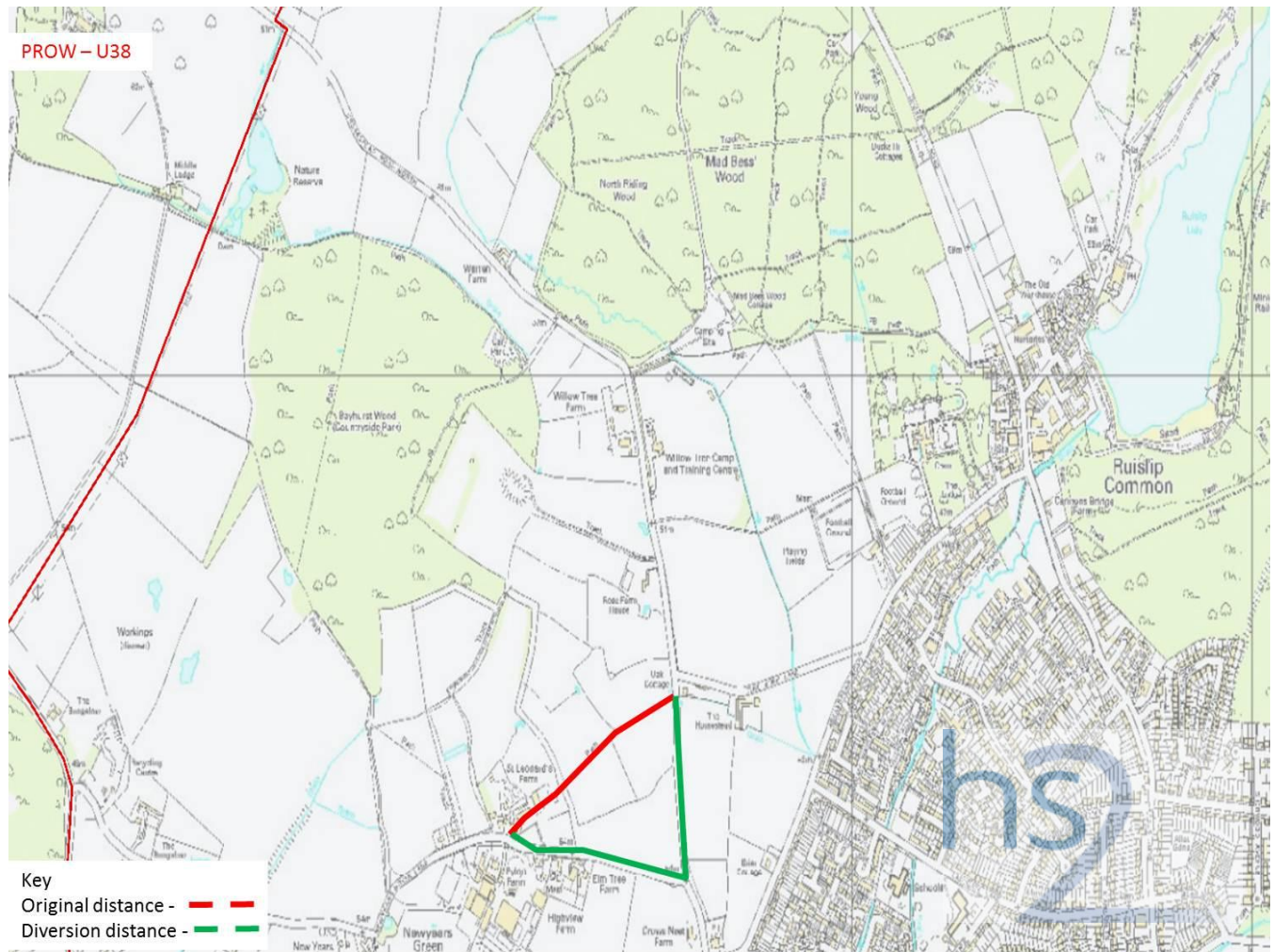
6.9.74 Figure 6-224.

Figure 6-224: Temporary PRoW diversion of footpaths U36 and U37



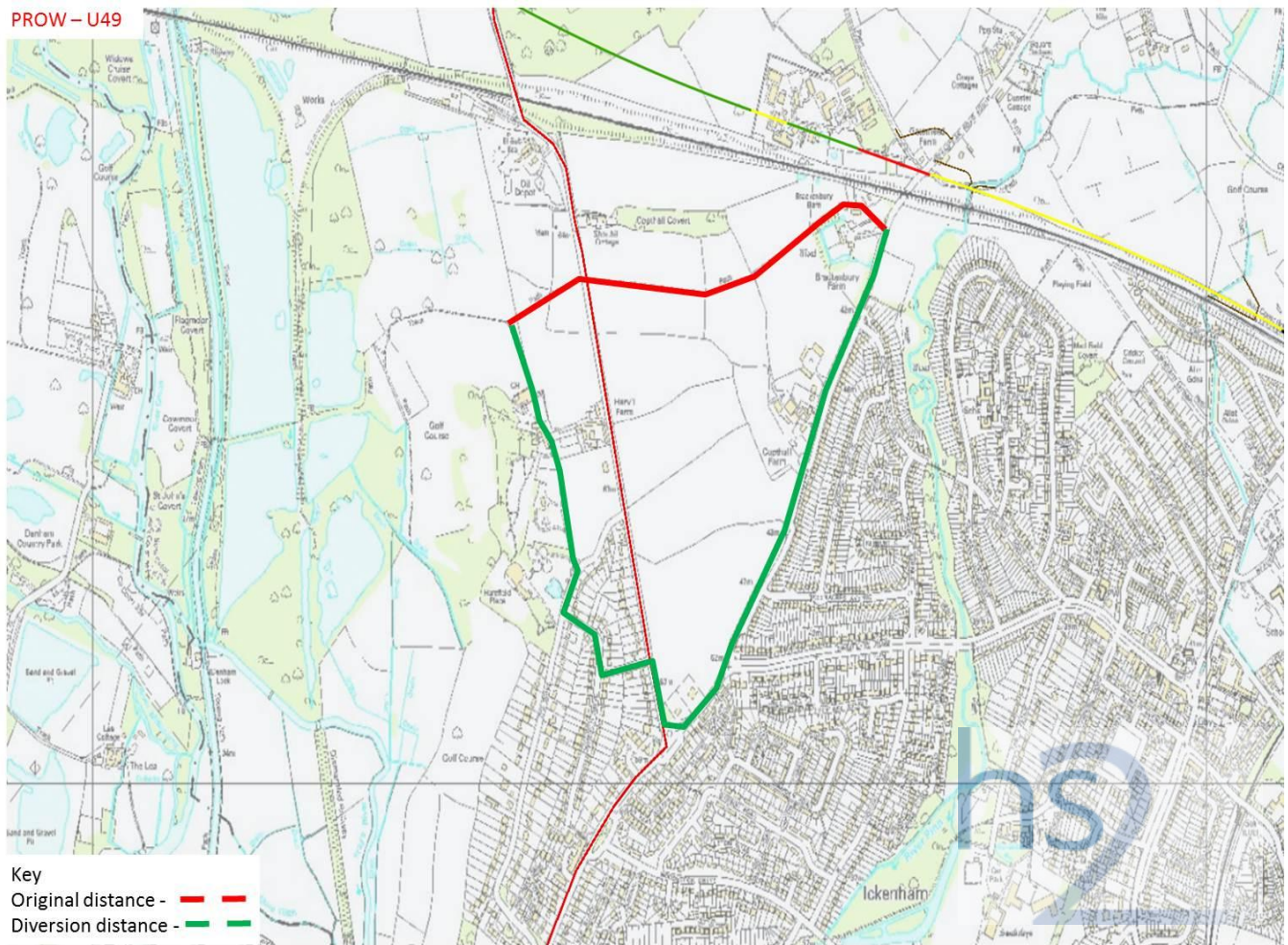
6.9.75 It will be necessary to temporarily close footpath U38 from north side of Newyears Green Lane connecting with Breakspear Road South. The diversion is via Newyears Green Lane and Breakspear Road South as shown in Figure 6-225.

Figure 6-225: Temporary PROW diversion of footpath U38



6.9.76 It will be necessary to temporarily close footpath U49 from the east side of Harvil Road to Breakspear Road South. The diversion will be via footpath east of Uxbridge golf course, The Drive, Highfield Drive, Harvil Road and then on to Breakspear Road South as shown in Figure 6-226.

Figure 6-226: Temporary PROW diversion of footpath U49



Avoidance and mitigation measures

6.9.77 The following measures (as outlined in Volume 2 Chapter 2) have been included as part of the engineering design of the Proposed Scheme and will avoid or reduce impacts on transport users:

- the Proposed Scheme in this CFA has been designed in tunnel, so major impacts associated with bridge replacement works have been avoided.
- the tunnel strategy has been selected to avoid excavated material from tunnels being extracted from vent shafts. Instead this will be transported off-site via rail, dramatically reducing HGVs on road network;
- lorry routes for construction equipment and materials are defined to ensure only the most suitable roads are used; and
- HGVs are routed, as far as reasonably practicable, along the strategic road and using designated roads for access, network as shown in Figure 6-206.

6.9.78 The draft CoCP (see Volume 5: Appendix CT-003-000/1) includes measures which seek to reduce the impacts and effects of deliveries of construction materials and equipment, including reducing construction lorry trips during peak background traffic periods. The draft CoCP includes HGV management and control measures.

- 6.9.79 An over-arching framework travel plan will be produced that will set out how travel plans can be used along with a range of potential measures to mitigate the impacts of traffic and transport movements associated with construction of the Proposed Scheme. As part of this, a construction workforce travel plan will be put into operation with the aim of reducing workforce commuting by private car, especially sole occupancy car travel. Where practical, particularly in the urban context, this will encourage the use of sustainable modes of transport.
- 6.9.80 The measures in the CoCP will include clear controls on vehicle types, hours of site operation, and routes for heavy goods vehicles, to reduce the impact of road based construction traffic. In order to achieve this, generic and site specific traffic management measures will be implemented during the construction of the Proposed Scheme on or adjacent to public roads, bridleways, footpaths and other PRow affected by the Proposed Scheme as necessary.
- 6.9.81 Specific measures will include:
- core construction compound operating hours will be 08:00-18:00 on weekdays and 08:00 to 13:00 on Saturdays and compound staff and workers will therefore generally arrive before the morning peak hour and depart after the evening peak hour (although the assessment has assumed that some of work journeys to the construction compounds take place within the morning and evening peak hours to reflect a reasonable worst case scenario); (draft CoCP, Section X);
 - Tunnelling and directly associated activities (such as removal of excavated material, supply of materials and maintenance of tunnelling equipment) will be carried out on a 24 hour day, 7 day week basis. Where reasonably practicable, material will be stockpiled within the site boundary for removal during normal working hours. For further information refer to draft CoCP Section X);
 - excavated material will be reused wherever reasonably practicable along the alignment of the Proposed Scheme which will reduce the effects of construction vehicles on the public highway;
 - construction deliveries will be planned for outside the peak hours wherever reasonably practicable; and
 - where reasonably practicable, the number of private car trips to and from the construction compounds (both workforce and visitors) will be reduced by encouraging alternative modes of transport or vehicle sharing.
- 6.9.82 Most signalised junctions in central London are under adaptive control, such as SCOOT, which optimises signal stages in real time. Many of those junctions subject to impacts could be mitigated through adaptive control. SCOOT will be most effective however, where it is the pattern of movement that changes rather than where there is a net increase in traffic at the junction.

South Ruislip to Ickenham (CFA6) construction impacts

Key construction transport issues

- 6.9.83 Construction of HS2 in this area will have temporary effects which will include increased traffic demand associated with inbound and outbound material movement and workers on a number of roads through the area.

6.9.84 There will be a nominal impact from construction upon access to West Ruislip stations potentially due to increased traffic flows arising from HS2 works. There are no road closures and diversions to general traffic. As indicated a number of PRow will be impacted.

6.9.85 The modelling results below also take account of construction traffic for arising from the main worksites in CFA4 and in CFA6.

Strategic and local road network traffic flows

6.9.86 As explained in the regional section, the scenarios considered are:

- WeLHAM construction test 1 refers to late 2017 / early 2018 with peak construction HGV movements around West Ruislip/Harvil Road in the period immediately prior to the start of operation of the Harvil Road Railhead. In parallel with this, peak construction traffic movements occur immediately prior to the start of operation of the Willesden Railhead for HS2 construction movements.
- WeLHAM construction Test 2 refers to the planned closure of Old Oak Common Lane for construction purposes within CFA4 over periods in 2023-2024.

6.9.87 For assessment purposes, construction Test 2 assumes all construction traffic from Old Oak Common and West Ruislip/Harvil Road will still be on the network, although in practice the bulk of materials will be moved by rail once the railheads are operational, and thus HGV numbers will be lower.

6.9.88 The highway modelling adds the above construction HGV flows to the overall background flows in WELHAM, and assigns this combined flow to the network.

6.9.89 As explained in CFA4, the analysis has been undertaken for the wider area along the line of the Proposed Scheme corridor covering CFA4 to CFA6 as a means of identifying both strategic and more localised impacts, and these are provided together in the CFA4 chapter. In the tables below only links in or abutting this CFA6 are reported.

6.9.90 For assessment purposes Heavy Vehicles include both normal HGV and buses. However it is noted that within the CFA4-6 area bus flows are relatively low compared to central London, and flow differences are thus small.

6.9.91 Traffic flow plots are presented as model output in passenger car units (pcu). The junction assessments which follow the link flow assessments are presented in pcu. The following tables (Table 6-234 and Table 6-324) set out flows on key roads, comparing 2021 baseline flows with 2021 construction case flows along the HS2 construction. In both cases the construction HGV route loadings shown in Figure 6-213 has been included.

6.9.92 The screenline analysis shows that the traffic impacts on general traffic flows are largely confined to the areas around the main construction interventions at Old Oak Common/ Victoria Road (CFA4) and at West Ruislip/Harvil Road (CFA6).

Table 6-323: WeLHAM AM peak hour model screenline analysis for construction tests 1 & 2.

		Future Baseline 2021		2021 Construction Test 1		Test 1 change from 2021 future baseline				2021 Construction Test 2		Test 2 change from 2021 future baseline			
Location	Direction	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles %	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles
Eastcote Lane	EB	651	13	653	13	2	0	0%	0%	652	13	1	0	0%	1%
	WB	322	12	333	12	11	0	3%	1%	335	12	13	0	4%	1%
CFA6															
West End Road	NB	685	43	689	32	4	-11	1%	-25%	688	31	3	-12	1%	-27%
	SB	528	28	502	27	-26	-1	-5%	-2%	499	27	-29	-1	-6%	-2%
Ickenham Road	NB	748	25	731	42	-17	16	-2%	65%	730	42	-18	16	-2%	65%
	SB	1122	72	1158	78	36	6	3%	8%	1158	77	37	5	3%	7%
Breakspear Road	NB	561	14	539	25	-22	11	-4%	81%	539	25	-22	11	-4%	81%
	SB	669	18	672	30	3	12	0%	65%	671	30	2	12	0%	65%
Harvil Road	NB	335	22	371	98	36	76	11%	345%	372	98	36	76	11%	345%
	SB	471	16	451	93	-19	76	-4%	463%	451	93	-20	76	-4%	463%
Swakeleys Road (south)	NB	1642	89	1609	192	-32	104	-2%	117%	1609	192	-32	103	-2%	117%
	SB	1574	123	1555	216	-19	92	-1%	75%	1555	216	-19	92	-1%	75%

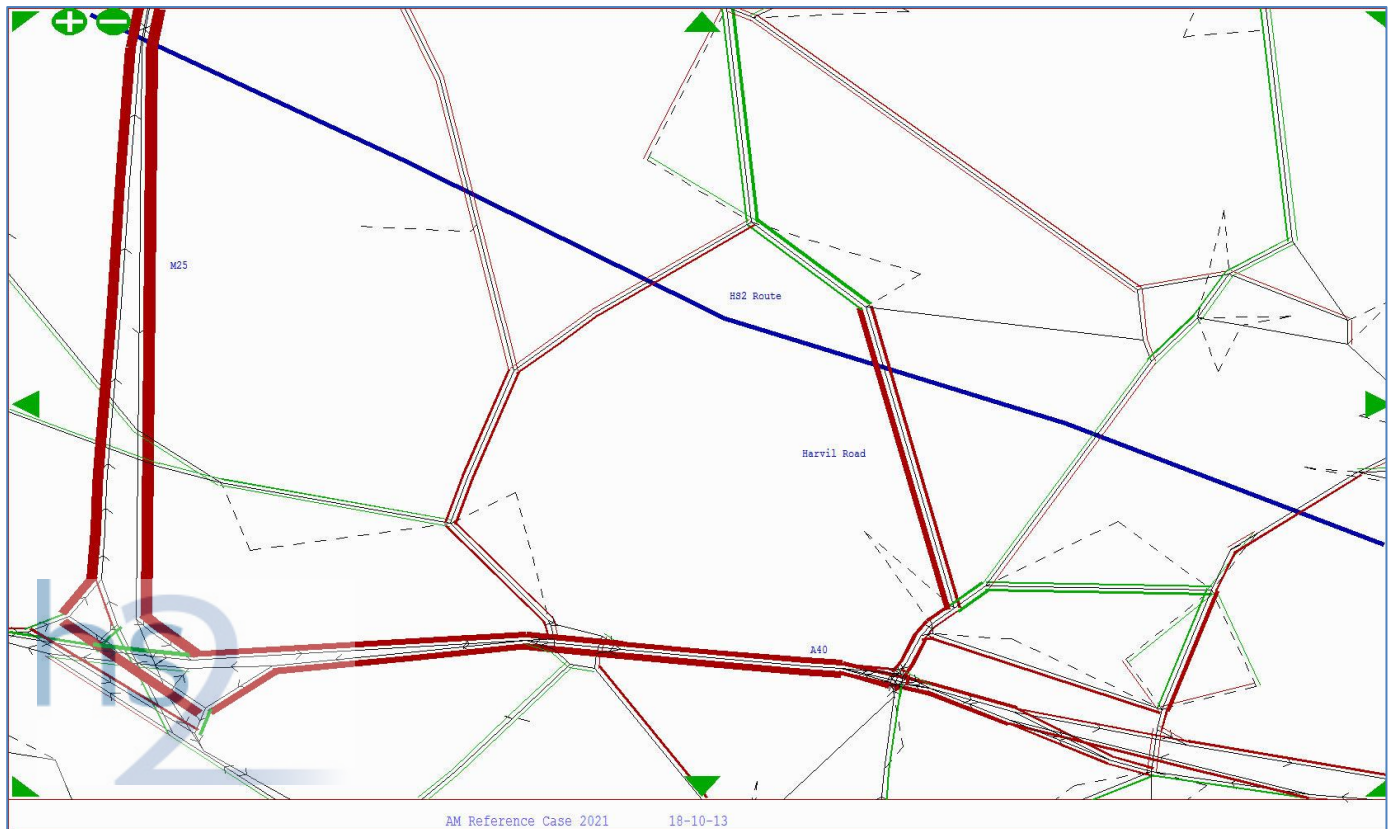
- 6.9.93 As indicated in Table 6-323, the screenline analysis for the AM peak hour shows that the traffic impacts on general traffic flows are largely confined to the areas immediately around the main construction site at West Ruislip/Harvil Road (CFA6). Consequently the greatest impact is on Harvil Road northbound. General traffic levels rise by 11% but HGV levels increase by 345% in both construction scenarios.
- 6.9.94 Away from the screenline, analysis has identified five links that increase substantially as shown in Table 6-324 below.

Table 6-324: Non-screenline links with substantial traffic changes AM peak

		Future Baseline 2021		2021 Construction Test 1		Test 1 change from 2021 future baseline				2021 Construction Test 2		Test 2 change from 2021 future baseline			
Location	Direction	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles %	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles
Swakeleys Drive / Woodstock Drive	EB	4	1	3	0	-3	-1	-48%	-97%	3	0	-3	-1	-49%	-98%
	WB	83	1	91	1	50	0	120%	1%	93	1	51	0	124%	-9%
Swakeleys Roundabout	WB	819	96	827	201	-13	91	-2%	84%	826	201	-14	91	-2%	84%
	EB	221	2	215	2	-8	0	-3%	-10%	215	2	-8	0	-3%	-10%
Ladygate Lane	WB	268	8	271	8	7	0	3%	1%	270	8	6	0	2%	1%
A40 eastbound off-slip	EB	1332	46	1258	153	-58	102	-4%	203%	1259	153	-58	102	-4%	203%
A40 westbound on-slip	WB	847	90	840	190	-13	92	-2%	94%	839	190	-14	92	-2%	94%

6.9.95 As will be seen above, the effect of the two construction tests are very similar and consequently only the plots of construction test 1 are shown. The flow changes arising from construction test 1 across the modelled network is illustrated graphically in Figure 6-227.

Figure 6-227: AM peak flow changes in WELHAM Test 1 compared to 2021 baseline (PCU) Red increase/Green decrease).



6.9.96 Table 6-325 shows that the PM peak hour leads to very similar conclusions as for the AM peak hour. It can be concluded that the impact of construction interventions is largely confined to the areas around the sites and on construction routes to the A40.

Table 6-325: WeLHAM PM peak hour model screenline analysis for construction tests

		Future Baseline 2021		2021 Construction Test 1		Test 1 change from 2021 future baseline				2021 Construction Test 2		Test 2 change from 2021 future baseline			
Location	Direction	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles %	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles
Eastcote Lane	EB	634	8	635	8	1	0	0%	0%	632	8	-2	0	0%	0%
	WB	459	10	463	10	4	0	1%	0%	467	10	8	0	2%	0%
CFA6															
West End Road	NB	872	10	880	11	8	0	1%	1%	873	11	2	0	0%	0%
	SB	620	10	623	11	3	0	0%	1%	621	11	1	0	0%	1%
Ickenham Road	NB	1087	23	1168	35	81	12	7%	53%	1169	34	83	11	8%	48%
	SB	944	21	910	38	-34	17	-4%	79%	909	38	-35	17	-4%	79%

		Future Baseline 2021		2021 Construction Test 1		Test 1 change from 2021 future baseline				2021 Construction Test 2		Test 2 change from 2021 future baseline			
Location	Direction	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles %	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles
Breakspear Road	NB	754	8	687	24	-67	16	-9%	206%	687	26	-67	18	-9%	222%
	SB	490	10	505	21	15	11	3%	118%	506	21	16	11	3%	118%
Harvil Road	NB	387	16	426	94	39	78	10%	484%	427	94	40	78	10%	484%
	SB	428	9	506	87	78	78	18%	898%	509	87	82	78	19%	898%
Swakeleys Road (south)	NB	1455	137	1404	240	-51	103	-4%	75%	1403	240	-52	103	-4%	75%
	SB	1337	79	1361	186	25	107	2%	136%	1363	186	27	107	2%	136%

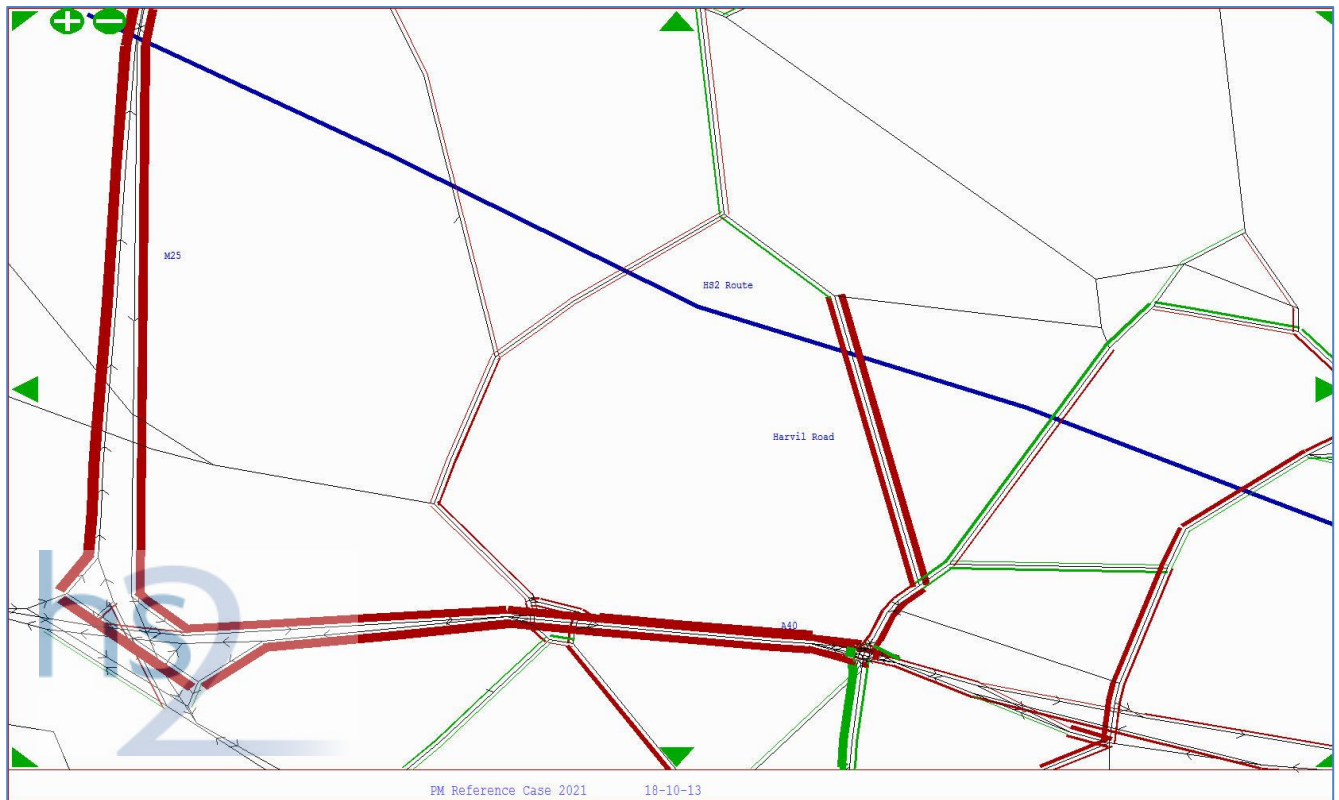
6.9.97 Again, some links away from the screenline increase substantially as shown in Table 6-326.

Table 6-326: Non-screenline links with substantial traffic changes PM peak (PCU)

		Future Baseline 2021		2021 Construction Test 1		Test 1 change from 2021 future baseline				2021 Construction Test 2		Test 2 change from 2021 future baseline			
Location	Direction	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles %	All Vehicles	Heavy Vehicles	All Vehicles	Heavy Vehicles	All Vehicles %	Heavy Vehicles
Swakeleys Drive / Woodstock Drive	EB	10	1	10	0	0	0	-3%	-64%	9	0	0	-1	-4%	-75%
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Swakeleys Roundabout	WB	1011	79	1074	186	63	107	6%	134%	1074	186	62	107	6%	134%
	EB	231	1	174	6	-57	5	-25%	431%	170	7	-61	6	-26%	536%
Ladygate Lane	WB	136	5	149	5	13	0	10%	-1%	149	5	14	0	10%	-1%
A40 eastbound off-slip	EB	784	107	837	213	53	107	7%	100%	838	213	54	107	7%	100%
A40 westbound on-slip	WB	889	71	950	177	60	107	7%	150%	949	177	59	107	7%	150%

6.9.98 The flow changes arising from construction test 1 across the modelled network is illustrated graphically in Figure 6-228.

Figure 6-228: PM peak flow changes in WelHAM test 1 compared to 2021 baseline (PCU) red increase/green decrease



Junction performance

- 6.9.99 Closer analysis has been undertaken on key junctions around the sites and on approaches to identify the impacts of HGV construction traffic flows and more localised junction impacts. It is important to note that whilst some junctions may operate within capacity, blocking back from downstream junctions can impact on upstream junctions.
- 6.9.100 In undertaking local junction assessments it should be noted that for shaft sites, which typically generate under 50 HGV movements per direction per day (i.e. under 1 HGV every 10 minutes), will not impact on junction operation. However, higher levels of HGV movements (eg from the major sites in CFA₄ and CFA₆) or diversionary effects from construction traffic management will potentially impact on link flows and on junction operation.

Pett's Hill / Wood End Road / Mandeville Road

- 6.9.101 Table 6-327 shows the performance of the junction under two construction scenarios alongside the 2021 reference case. It can be seen that the impacts on this junction are relatively small. Consequently no specific mitigation is considered necessary.

Table 6-327: Construction impacts at Pett's Hill / Wood End Road / Mandeville Road junction (signals)

	2021 Reference			Test 1			Test 2		
	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
AM Peak (08:00-09:00)									
Pett's Hill	344	17	0	345	17	0	344	17	0
Wood End Lane	333	32	0	333	32	0	334	32	0

	2021 Reference			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Mandeville Road	784	44	0	781	44	0	782	44	0
	2021 Reference			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Pett's Hill	378	19	0	382	19	0	384	19	0
Wood End Lane	396	38	0	398	39	0	395	38	0
Mandeville Road	840	45	0	840	45	0	831	44	0

High Road, Ickenham / Long Lane / Swakeleys Road

6.9.102 Table 6-328 shows the performance of the junction under the two construction scenarios alongside the 2021 reference case. It can be seen that the impacts on this junction are relatively small.

Table 6-328: Construction impacts at High Road, Ickenham / Long Lane / Swakeleys Road junction (signals)

	2021 Reference			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
High Road, Ickenham	1109	42	0	1137	42	0	1136	42	0
Long Lane	148	18	0	123	16	0	124	16	0
Swakeleys Road	589	54	1	559	51	1	558	51	1
	2021 Reference			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
High Road, Ickenham	874	41	4	857	42	4	856	42	4
Long Lane	809	52	0	913	57	0	917	57	0
Swakeleys Road	150	51	1	138	57	2	135	57	2

Breakspear Road / Swakeleys Road

6.9.103 Table 6-329 shows the performance of the junction under two construction scenarios alongside the 2021 reference case. It can be seen that the impacts on this junction are relatively small.

Table 6-329: Construction impacts at Breakspear Road / Swakeleys Road junction (signals)

	2021 Reference			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Breakspear Road	687	84	1	702	83	1	700	83	1
Swakeleys Road (WB)	299	48	0	240	41	0	239	41	0
Swakeleys Road (EB)	1176	70	0	1120	65	0	1120	65	0

	2021 Reference			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Breakspear Road	499	49	0	526	52	0	527	52	0
Swakeleys Road (WB)	331	49	0	275	43	0	272	43	0
Swakeleys Road (EB)	978	57	0	916	54	0	914	54	0

Harvil Road / Swakeleys Road

6.9.104 Table 6-330 shows the performance of the junction under two construction scenarios alongside the 2021 reference case.

Table 6-330: Construction impacts at Harvil Road / Swakeleys Road junction (signals)

	2021 Reference			Test 1			Test 2		
AM Peak (08:00-09:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Harvil Road	487	104	8	544	106	8	544	106	8
Swakeleys Road (WB)	997	106	8	937	106	8	935	106	8
Swakeleys Road (EB)	1449	94	0	1525	97	0	1525	97	0
	2021 Reference			Test 1			Test 2		
PM Peak (17:00-18:00)	Flow	RFC	Max Queue	Flow	RFC	Max Queue	Flow	RFC	Max Queue
Harvil Road	436	65	1	593	81	2	596	82	2
Swakeleys Road (WB)	899	88	1	871	98	5	869	98	5
Swakeleys Road (EB)	1216	81	0	1277	85	0	1276	85	0

6.9.105 It can be seen that, whilst the junctions operates at or over capacity on some arms (and thus potentially causing blocking back to upstream junctions), the impacts of interventions related to the Proposed Scheme on this junction are relatively small.

Parking and loading

6.9.106 At present the road to be used as a site access to the South Ruislip Shaft main site is heavily used for car parking which is not subject to any controls. This will be removed in order to ensure safe and convenient access to the site. Displacement impacts are still to be investigated.

6.9.107 The use of Ruislip Golf Club for access during the construction phase will entail the loss of around 45 private off street parking spaces at Ruislip Golf Club. The relocation of these parking spaces is yet to be confirmed.

6.9.108 The private off-street parking at the Merck Sharp research facility site will experience a loss of approximately 90 spaces. The relocation of these parking spaces is yet to be confirmed.

6.9.109 The planned CoCP proposes measures to reduce or prevent staff parking on public roads near worksites. Additionally, the proposed worksites will have no or minimal impact on the length of

kerbline available for parking. Consequently there should be no material impact on parking arising from construction of the scheme.

Accidents and safety

- 6.9.110 The accident data for the 36 month period from April 2009 to March 2012 in the vicinity the CFA6 worksites revealed no concentrations at or near the locations of proposed worksites.
- 6.9.111 While the underlying risks of collisions should be unchanged near the worksites (due to minimal changes in traffic flow), a small residual risk of collisions during the construction period will remain due to new construction vehicle movements into and out of the worksites.
- 6.9.112 All new site access and egress locations will be subject to a safety assessment as part of the design process and all vehicle movements into and out of the site are to be under banksman control as necessary.
- 6.9.113 There are no issues identified for the future baseline network operation as a result of changes to the highway network or travel demands and, therefore, accident and safety records for the future baseline assessment are assumed to be the same as those for the baseline assessment.

Buses and interchange

- 6.9.114 It is not expected that the construction of the Proposed Scheme will require bus route diversions or resulting delays to buses, as no road closures are proposed.
- 6.9.115 Construction of the proposed scheme will not result in any temporary loss of pedestrian physical linkage at any London Underground stations in the study area.

Pedestrians and cyclists

- 6.9.116 The following table summarises the impact on pedestrians arising from PRoW diversions shown in Figure 6-219 to Figure 6-226.

Table 6-331: Assessment of PRoW diversions

Name	Location	Diversion route	Approximate length of diversions	Programme	Duration
Footpath U81.	From north side of The Greenway via footpath R146 in Ruislip Golf Course to Clack Lane Ruislip.	The Greenway, Ickenham Road, Hill Lane and Clack Lane	836m	Q2 2017 – Q1 2022	4 years
Footpath U46	From the east side of Breakspear Road South connecting with footpath U45	Hoyle Crescent, Bushey Road, Copthall Road East and Breakspear Road south	843m	Q2 2017 – Q1 2022	4 years
Footpath U43	From east side of Breakspear Road South connecting with footpaths U44 and U45	Breakspear Road South, Tile Kiln Lane and Clack Lane via R183, R144	370m	Q2 2017 – Q1 2022	4 years
Footpath U51	From east side of Breakspear Road South to Copthall Road West	Breakspear Road South and Copthall Road West	-21m	Q2 2017 – Q1 2022	4 years
Bridleway	From west side of Breakspear Road South connecting to	Footpath 41 and Newyears Green	704m	Q1 2017 – Q2	5 years

Name	Location	Diversion route	Approximate length of diversions	Programme	Duration
U42	Newyears Green Lane	Lane		2022	
Footpaths U36,	From the north side of Newyears Green Lane connecting to the footpath U86	Newyears Green Lane, Breakspear Road South, Breakspear Road North and footpath U86.	2301m	Q1 2017 – Q4 2022	6 years
Footpaths U37	From the north side of Newyears Green Lane connecting to the footpath U86	Newyears Green Lane, Breakspear Road South, Breakspear Road North and footpath U86	2515m	Q1 2017 – Q4 2022	6 years
Footpath U38	From north side of Newyears Green Lane connecting with Breakspear Road South	Newyears Green Lane and Breakspear Road South	277m	Q1 2017 – Q4 2022	6 years
Footpath U49	From east side of Harvil Road to Breakspear Road South	Footpath east of Uxbridge golf course, The Drive, Highfield Drive, Harvil Road and Breakspear Road South.	1190m	Q1 2017 – Q4 2022	6 years

Avoidance and mitigation measures

- 6.9.117 The engineering and construction design has been conceived to minimise impacts during construction. All construction activity will be undertaken in accordance with the CoCP which seeks to minimise adverse impacts. The measures in the CoCP will include clear controls on vehicle types, hours of site operation, and routes for heavy goods vehicles, to reduce the impact of road based construction traffic. In order to achieve this, generic and site specific traffic management measures will be implemented during the construction of the project on or adjacent to public roads, bridleways, footpaths and other PRow affected by the Proposed Scheme as necessary.
- 6.9.118 Where reasonably practicable, the number of private car trips to and from the site (both workforce and visitors) will be reduced by encouraging alternative modes of transport or vehicle sharing. A framework construction workers travel plan will be produced by each principal contractor which will aim to encourage the use of sustainable modes of transport and reduce the impact of workforce traffic on the highway network.
- 6.9.119 Because the impacts have been assessed to be only very limited within CFA6, no mitigation is considered necessary.
- 6.9.120 Table 6-311 and Table 6-333 show the links that will have substantial increases in all traffic and/or HGV traffic in construction tests 1 and 2 respectively. For clarity this covers the western end of CFA5 through to the eastern end of CFA7. N/A is used to indicate where the link does not have a substantial increase (i.e. only general traffic or only HGV flows).

Table 6-332: Links with increased traffic in construction test 1

2021 Construction Test 1		Increase in General Traffic		Increase in HGVs	
CFA	Roads impacted by increase	PCU	%	PCU	%
6	Swakeleys Road (East)	N/A	N/A	26	87%
6	Swakeleys Road (South)	N/A	N/A	396	187%

6	Swakeleys Road (centre)	N/A	N/A	98	65%
6	Harvil Road	N/A	N/A	303	580%
6	Breakspear Road South	N/A	N/A	49	118%
6	Ickenham Road	N/A	N/A	28	68%
6	Ladygate Lane	N/A	N/A	4	143%
6	A40 Slip Road	N/A	N/A	207	154%
6	Swakeleys Road Roundabout	N/A	N/A	193	121%
6	Swakeleys Drive	48	121%	N/A	N/A
7	M25 (Junction 16-17)	N/A	N/A	236	53%
7	M40/A40 East West link	N/A	N/A	471	156%
7	J16 (M25)	N/A	N/A	235	313%

Table 6-333: Links with increased traffic in construction test 2

2021 Construction Test 2		Increase in General Traffic		Increase in HGVs	
CFA	Roads impacted by increase	PCU	%	PCU	%
6	Swakeleys Road (East)	N/A	N/A	25	84%
6	Swakeleys Road (South)	N/A	N/A	397	187%
6	Swakeleys Road (centre)	N/A	N/A	98	65%
6	Harvil Road	N/A	N/A	303	580%
6	Breakspear Road South	N/A	N/A	50	121%
6	Ickenham Road	N/A	N/A	27	66%
6	Ladygate Lane	N/A	N/A	5	180%
6	A40 Slip Road	N/A	N/A	207	154%
6	Swakeleys Road Roundabout	N/A	N/A	193	121%
6	Swakeleys Drive	49	125%	N/A	N/A
7	M25 (Junction 16-17)	N/A	N/A	236	53%
7	M40/A40 East West link	N/A	N/A	470	156%
7	J16 (M25)	N/A	N/A	236	313%

South Ruislip to Ickenham (CFA6) Proposed Scheme operation description and impacts

- 6.9.121 Within CFA6 there are no operational sites, and no permanent impact on roads other than small adjustments to property accesses. There are no changes to the public transport operations or networks.

- 6.9.122 However, it is necessary to permanently close a small number of sections of footpaths, the mitigation being the provision of alternative routes, and permanently remove some parking spaces.

Pedestrian, cyclists and equestrians

- 6.9.123 It will be necessary to permanently divert three footpaths as shown in Figure 6-229 to Figure 6-231.

Figure 6-229: Permanent PRoW diversion of footpath U42



Figure 6-230: Permanent PRoW diversion of footpath U45 & 46

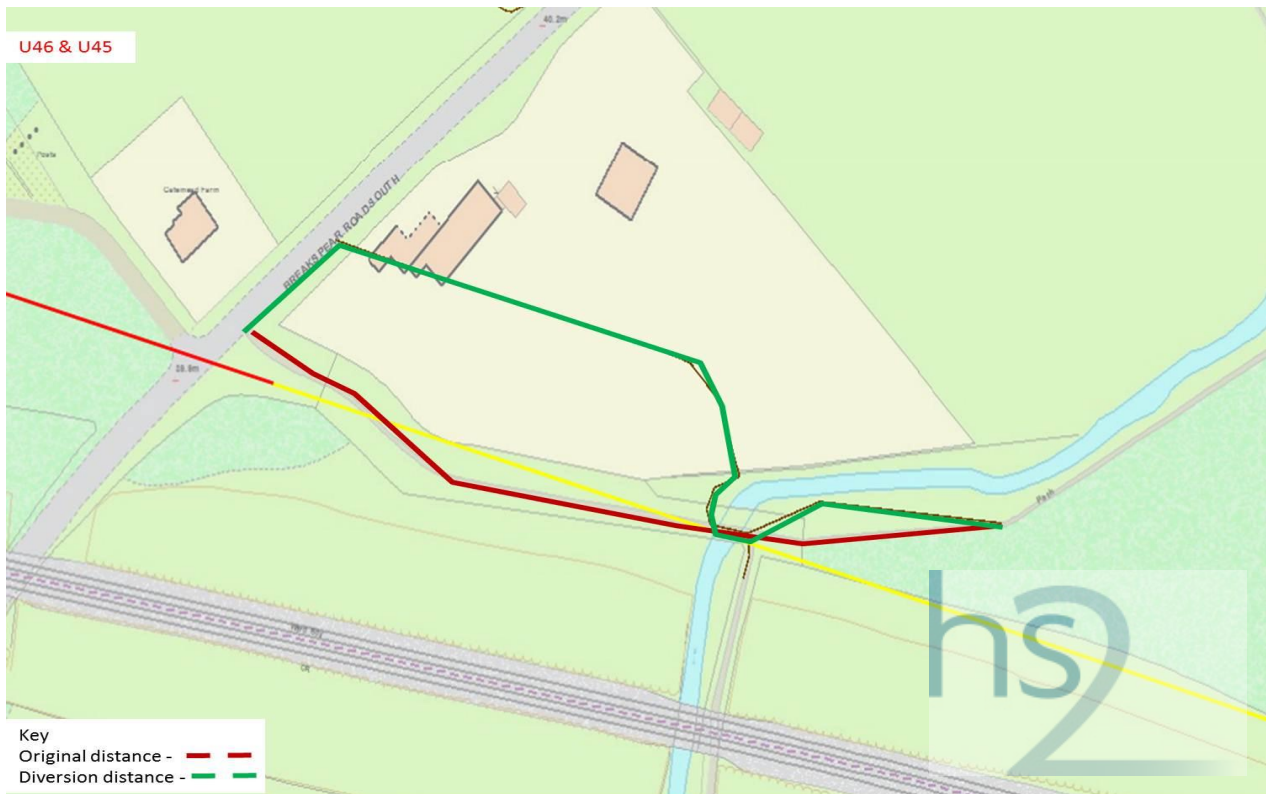
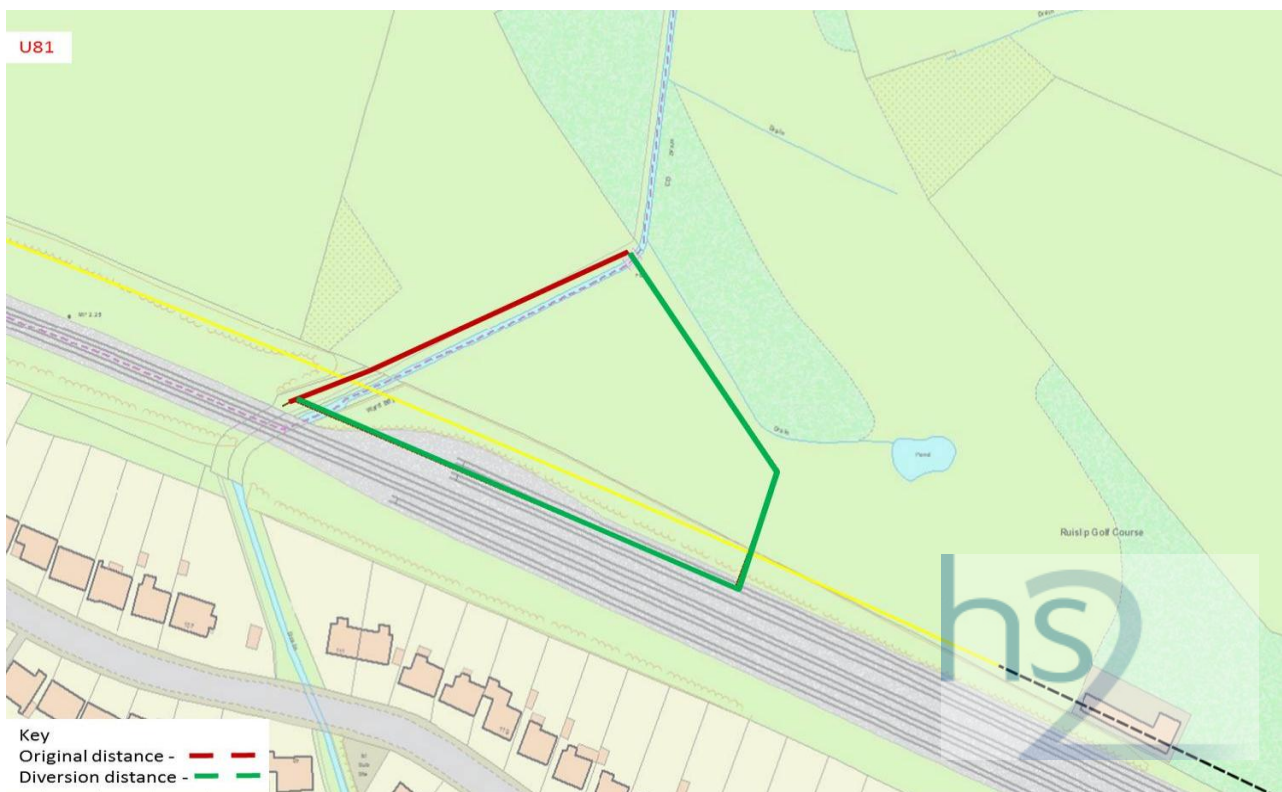


Figure 6-231: Permanent PRoW diversion of footpath U81



6.9.124 These diversions are summarised in Table 6-334.

Table 6-334: Details of permanent footpath diversions

Name	Location	Diversion route	Approximate length of diversions	Programme	Duration
Footpath U81.	From north side of The Greenway via footpath R146 in Ruislip Golf Course to Clack Lane Ruislip.	New alignment to the east of the existing PRoW	137m	On completion of adjacent construction activities	Permanent
Footpath U46 & U45	From the east side of Breakspear Road South connecting with footpath U47 Road South	Swakeleys Road and new alignment to the north of the existing PRoW	26m	On completion of adjacent construction activities	Permanent
Footpath U42	From west side of Breakspear Road South connecting to Newyears Green Lane with footpaths U44 and U45	Swakeleys Road and new alignment north of the existing PRoW	106m	On completion of adjacent construction activities	Permanent

Parking and loading

- 6.9.125 There will be a permanent loss of approximately 90 spaces at the private Merck Sharp research facility site due to the Proposed Scheme. The provision of alternative parking spaces is yet to be confirmed.

6.10 London region sensitivity analysis

Context

- 6.10.1 In order to test the Proposed Scheme against potential, but as yet unconsented, transport infrastructure and development schemes in London, TfL and HS2 Ltd agreed to undertake a number of sensitivity tests. The main objective of undertaking the sensitivity testing was to ascertain any potential capacity issues on the transport network when the proposals for HS2 were combined with any of these potential schemes and to understand how any of these schemes could help mitigate any transport impacts of HS2.
- 6.10.2 The scale of a number of these schemes means that they are likely to have generation, redistribution or mode shift impacts, i.e. they could generate new demand, lead to a change in origin or destination due to new travel opportunities or could effect a shift from other modes, including private car. For these reasons, and because TfL's Railplan model uses a fixed demand, it was necessary to run TfL's London Transportation Studies (LTS) model for certain sensitivity tests which takes trip generation, redistribution and modal choice into account.
- 6.10.3 Due to the number of runs required, it was agreed by TfL and HS2 Ltd to undertake sensitivity tests for the 2041 morning peak period which will give HS2 demand resulting from the Phase Two network. However, some inter-peak analysis was undertaken for the purposes of the LTS runs. All Railplan models were based on the 2041 Phase Two morning peak scenario, and all comparisons in this section are made against this scenario.
- 6.10.4 The sensitivity tests undertaken are set out in Table 6-335. The impact of these schemes in terms of station impacts, line loadings and crowding are covered in the following sections with all comparisons made against the 2041 AM future baseline plus operation scenario in order to isolate the incremental impact of each scheme.

Table 6-335: Railplan and CLoHAM sensitivity tests

Scenario	Year/time period	Separate LTS run required
2041 future baseline plus operation	2041 AM peak	NA
Overground connectivity at Old Oak Common	2041 AM peak	Yes
Crossrail 1 services to/from WCML	2041 AM peak	No
Crossrail 2	2041 AM peak	Yes
GWML sensitivities	2041 AM peak	No
Euston Area Plan	2041 AM peak	Yes
Old Oak Common OAPF without Overground	2041 AM peak	Yes
Old Oak Common OAPF with Overground	2041 AM peak	Yes
Additional supply enhancements	2041 AM peak	Yes

Overground connectivity at Old Oak Common

Scheme details

- 6.10.5 This sensitivity test comprises additional platforms on the North London Line near Acton Wells Junction with walk links to the main Old Oak Common station, as well as the following service changes (in both directions):
- Richmond – Stratford services call at this new station;
 - Clapham Junction – Willesden Junction/Stratford, diverted and call at this new station;
 - additional two tph Clapham Junction – Old Oak Common in the peak hours only; and
 - all Southern services from Croydon/Clapham Junction to Shepherds Bush (and reverse) if any to be extended to end/start from this new station.
- 6.10.6 The key advantage of this scheme would be to connect the orbital London Overground services into the Proposed Scheme proposals at Old Oak Common. This would allow HS2 passengers to change at Old Oak Common, with direct links to Clapham Junction, Richmond and stations on the North London Line. Given the likely pressure at Euston, this scheme could potentially assist by attracting more HS2 passengers to interchange at Old Oak Common.

Demand

- 6.10.7 An LTS scenario was required to provide updated demand matrices for this test. This utilised the LTS network developed as part of the Old Oak Common OAPF work, with the Old Oak Common station including Overground platforms but with the following amendments to better represent the latest station design and Overground connections:
- updated station design;
 - utilisation of the existing LTS implementation for GWML services and bus route extensions (Routes 7, 72, 283 and 487); and
 - utilisation of new Overground (OV and SO) coding from the Railplan updates above.
- 6.10.8 The resulting LTS Public Transport (PT) matrices were amended to include HS2 demand. Whilst no analysis of the likely highway impacts has been assessed, highway demand is forecast to reduce with the Overground station in place.

Comparison with 2041 AM Proposed Scheme

Station demand

- 6.10.9 Table 6-336 shows a reduction in HS2 boarders and alighters at Euston of 2,310 and 1,310 respectively with these passengers boarding and alighting at Old Oak Common instead due to its improved connections. There are corresponding reductions in onward LU movements at Euston. Overground changes are picked up in the Overground Acton Central to Willesden Junction (NLL) and Overground Shepherds Bush to Willesden Junction (WLL) line flows of Table 6-338.

Table 6-336: 2041 AM Euston station demand, 07:00-10:00

Description	Future baseline plus operation 2041 AM			Old Oak Common Overground connectivity sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (down)	4,074	-	4,074	4,033	-	4,033
Euston suburban (up)	-	24,608	24,608	-	24,610	24,610
Euston inter-city (down)	2,335	-	2,335	2,335	-	2,335
Euston inter-city/other (up)	-	7,126	7,126	-	7,138	7,138
Euston HS2 (up)	-	24,666	24,666	-	23,354	23,354
Euston HS2 (down)	18,269	-	18,269	15,960	-	15,960
Sub-total: Euston NR	24,678	56,400	81,078	22,328	55,102	77,430
Euston LU						
Euston Northern (Bank northbound, Charing Cross northbound)	2,333	4,239	6,572	2,300	3,598	5,898
Euston Northern (Charing Cross southbound)	9,092	2,550	11,642	8,576	2,490	11,066
Euston Northern (Bank northbound)	4,174	3,819	7,993	4,128	3,768	7,896
Euston Northern (Bank southbound)	9,237	8,241	17,478	9,252	8,241	17,493
Euston Victoria (northbound)	3,616	9,924	13,540	3,560	9,061	12,621
Euston Victoria (southbound)	12,892	5,338	18,230	12,636	5,278	17,914
Sub-total: Euston LU	41,344	34,111	75,455	40,452	32,436	72,888
Euston Square LU						
Euston Square Met (northbound/westbound)	3,590	8,878	12,468	3,486	8,717	12,203
Euston Square Met (southbound/eastbound)	11,850	8,301	20,151	11,684	7,973	19,657
Sub-total: Euston Square LU	15,440	17,179	32,619	15,170	16,690	31,860
Old Oak Common						
Old Oak Common NR slow down	4,022	10,179	14,201	4,310	9,671	13,981
Old Oak Common NR slow up	25,271	7,907	33,178	25,246	7,562	32,808
Old Oak Common NR fast down	7,284	0	7,284	7,591	-	7,591
Old Oak Common NR fast up	-	17,371	17,371	-	18,359	18,359
Old Oak Common HS2 up	-	9,477	9,477	-	10,789	10,789
Old Oak Common HS2 down	7,956	-	7,956	10,265	-	10,265
Sub-total: Old Oak Common	44,533	44,934	89,467	47,412	46,381	93,793

Demand at other stations

6.10.10 Table 6-337 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway. There are limited increases at some stations but larger reductions particularly at Waterloo, Paddington, Victoria and Euston/Euston Square. This is a result of additional capacity to/from Old Oak Common which reduces passenger loadings on HS2 between Old Oak Common and Euston and diverts passengers from Paddington, Victoria and Waterloo due to WLL and NLL improvements, together with the generative impacts (through LTS) of additional capacity.

Table 6-337: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	Future baseline plus operation 2041 AM	Old Oak Common Overground connectivity sensitivity test 2041 AM	Absolute difference	% difference
Warren Street	16,929	17,123	194	1%
High Street Kensington	6,923	7,045	122	2%
Old Street	21,263	21,368	105	0%
Elephant & Castle	22,651	22,483	-168	-1%
Goodge Street	21,091	20,920	-171	-1%
King's Cross	55,929	55,740	-189	0%
Moorgate	35,533	35,338	-195	-1%
Notting Hill Gate	11,917	11,706	-211	-2%
Bond Street	67,789	67,565	-224	0%
Leicester Square	27,444	27,209	-235	-1%
South Kensington	25,741	25,377	-364	-1%
Farringdon	70,401	69,904	-497	-1%
Oxford Circus	86,079	85,164	-915	-1%
Waterloo	144,306	143,006	-1,300	-1%
Paddington	60,043	57,529	-2,514	-4%
Victoria	146,426	143,424	-3,002	-2%
Euston (inc. Euston Square)	114,718	111,176	-3,542	-3%
Sub-total	935,183	922,077	-13,106	-1%
Total (all Zone 1)	2,088,562	2,075,611	-12,951	-1%
Camden Town	18,390	18,277	-113	-1%
Mornington Crescent	2,922	2,915	-7	0%
Ealing Broadway	29,884	29,410	-474	-2%

Impact on flows

- 6.10.11 Table 6-338 and Figures 1 to 3 show the passenger flow impact of the Overground connectivity at Old Oak Common compared to the 2041 AM future baseline plus operation. Note that scales on these and later plots differ for ease of interpretation. The LU network shows modest flow reductions of less than 1,000 passengers over the 07:00-10:00 period on the Central Line between Shepherd's Bush and Oxford Circus, the Victoria Line between Victoria and Oxford Circus and the Northern Line Charing Cross branch between Embankment and Euston. Smaller flow differences occur on the District Line between Earls Court and Paddington, the eastbound District Line between Earls Court and Victoria and the Bakerloo Line between Paddington and Baker Street.
- 6.10.12 On NR, the addition of a new station connecting Old Oak Common to the Overground, results in increased passenger flow on the Overground Acton Central to Willesden Junction (NLL) of 1,170 northbound and Shepherd's Bush to Willesden Junction (WLL) of 2,100 northbound and 2,880 southbound.
- 6.10.13 With the exception of HS2 services into Euston (Figure 6-233 and Table 6-336), which experience a passenger decrease of around 2,300 eastbound and 1,300 westbound in each direction, the impacts on the NR network are limited.
- 6.10.14 The strengthening of the Clapham Junction – Old Oak Common (WLL) service by an additional two tph has a substantial impact on flows from Clapham Junction northbound with an additional 4,900 northbound and 3,700 southbound as far as Shepherd's Bush. As well as newly generated trips, these were trips previously using LU services including the parallel Central Line (Shepherd's Bush-Oxford Circus) and District Line (towards Victoria)/Victoria Line (towards Euston) to make north-south journeys.

Table 6-338: 2041 network impacts, AM peak period

Services		Future baseline plus operation 2041 AM	Old Oak Common Overground connectivity sensitivity test 2041 AM	% difference
Euston Classic suburban	Inbound	24,608	24,610	0%
	Outbound	4,074	4,033	-1%
Euston Classic inter-city	Inbound	7,126	7,138	0%
	Outbound	2,335	2,335	0%
HS2 at Euston	Inbound	24,666	23,354	-5%
	Outbound	18,269	15,960	-13%
HS2 at Old Oak Common	Inbound	34,143	34,143	0%
	Outbound	26,224	26,224	0%
Sub-total at Euston	Inbound	56,400	55,102	-2%
	Outbound	24,678	22,328	-10%
Victoria Line, north of Euston	Northbound	26,527	26,708	1%

Services		Future baseline plus operation 2041 AM	Old Oak Common Overground connectivity sensitivity test 2041 AM	% difference
	Southbound	66,699	66,779	0%
Victoria Line, south of Euston	Northbound	32,834	32,209	-2%
	Southbound	74,254	74,137	0%
Northern Line (Bank branch), north of Euston	Northbound	21,444	21,297	-1%
	Southbound	39,027	38,639	-1%
Northern Line (Bank branch), south of Euston	Northbound	21,088	20,937	-1%
	Southbound	40,022	40,014	0%
Northern Line (Charing Cross branch), north of Euston	Northbound	12,629	12,485	-1%
	Southbound	35,810	35,725	0%
Northern Line (Charing Cross branch), south of Euston	Northbound	14,535	13,783	-5%
	Southbound	42,352	41,811	-1%
Metropolitan/Hammersmith & City, Circle Line (west of Euston Square)	Eastbound	35,855	35,565	-1%
	Westbound	33,379	33,239	0%
Metropolitan/Hammersmith & City, Circle Line (east of Euston Square)	Eastbound	39,404	39,276	0%
	Westbound	38,667	38,470	-1%
GWML slow/Crossrail (Acton Main Line to Old Oak Common)	Eastbound	31,491	31,339	0%
	Westbound	14,042	14,420	3%
Crossrail Old Oak Common to Paddington	Eastbound	47,386	47,605	0%
	Westbound	20,200	19,782	-2%
Crossrail Paddington to Bond Street	Eastbound	52,175	52,495	1%
	Westbound	25,415	25,471	0%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,722	44,002	1%
	Southbound	43,822	43,829	0%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,165	2,331	100%
	Southbound	1,596	1,271	-20%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	3,013	5,125	70%
	Westbound	3,995	6,880	72%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	18,113	17,172	-5%
	Westbound	7,783	7,411	-5%
GWML slow (Old Oak Common to	Eastbound	1,469	1,418	-3%

Services		Future baseline plus operation 2041 AM	Old Oak Common Overground connectivity sensitivity test 2041 AM	% difference
Paddington ML)	Westbound	0	0	

Figure 6-232: LU flow differences 2041 AM peak Old Oak Common Overground

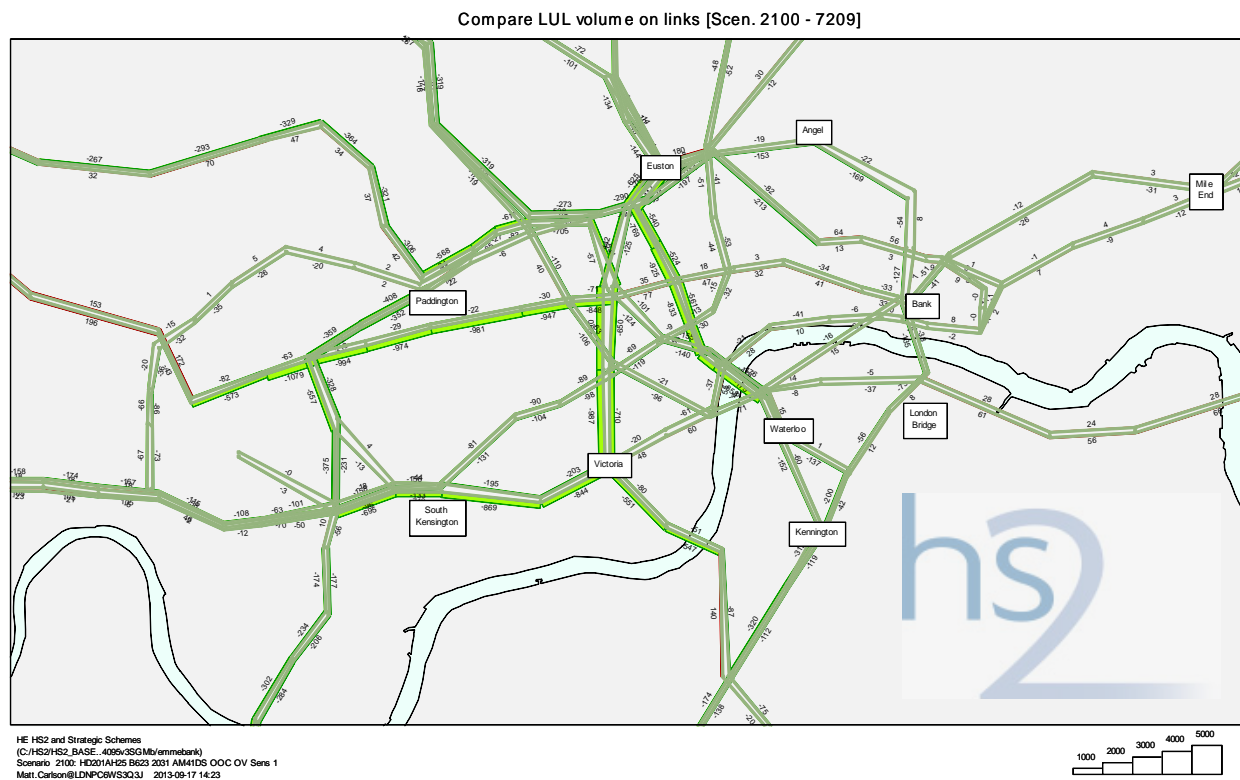


Figure 6-233: NR flow differences 2041 AM peak Old Oak Common Overground

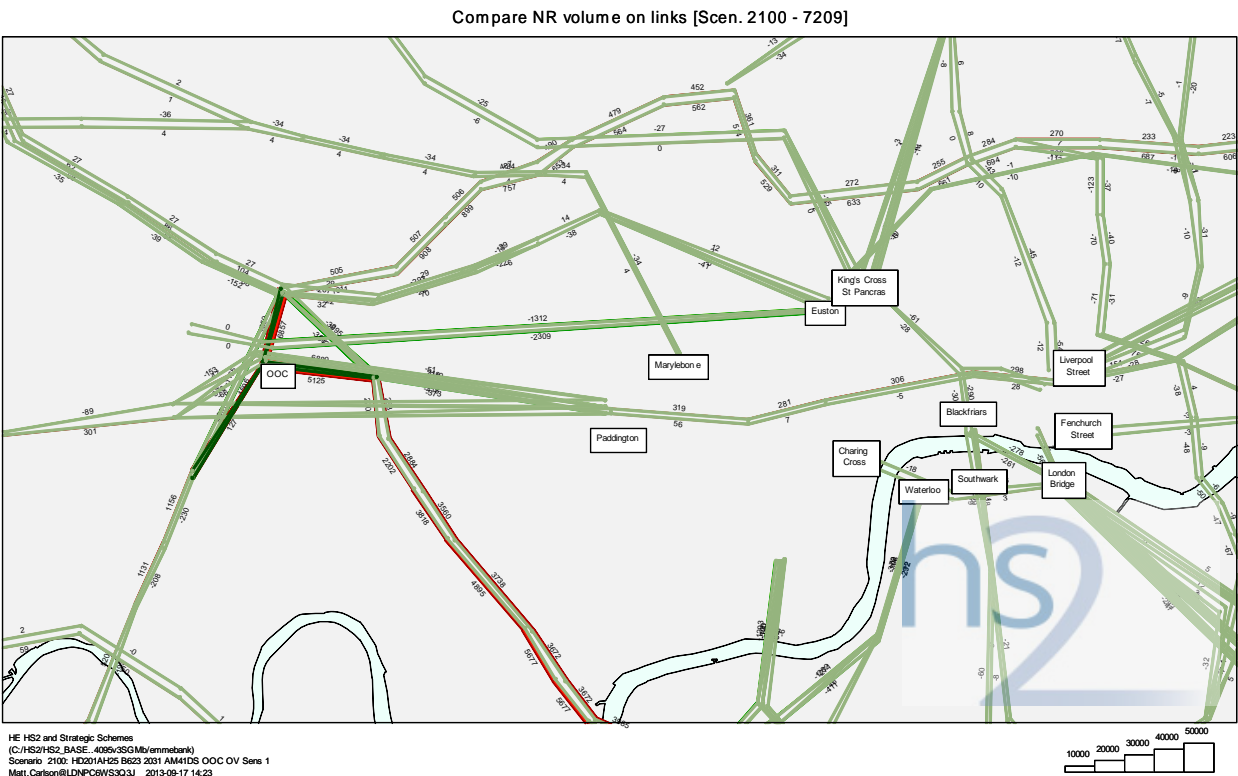
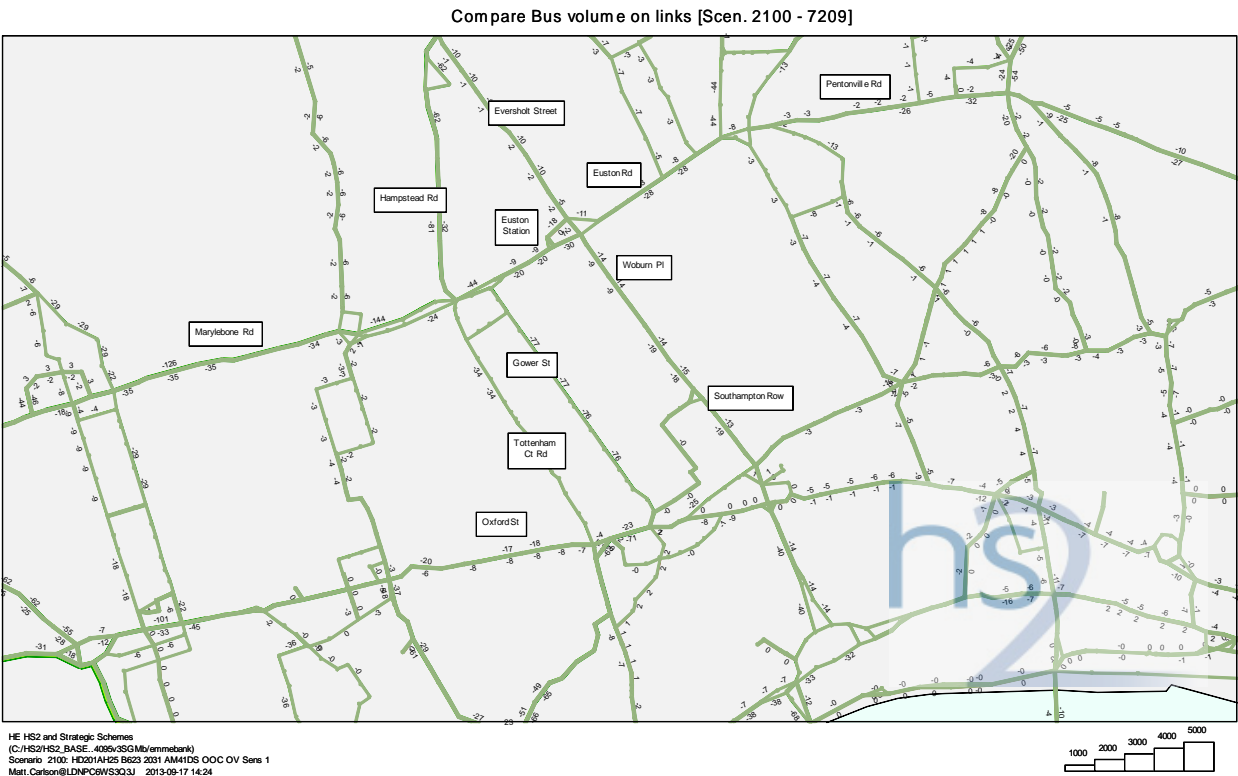


Figure 6-234: Bus flow differences 2041 AM peak Old Oak Common Overground



Impacts at Old Oak Common

- 6.10.15 The impact of the Overground connectivity test on interchange movements at Old Oak Common is substantial with an overall increase in movements of approximately 20%. This consists largely of trips interchanging to/from HS2 services with a redistribution of interchange movements within the station.
- 6.10.16 Volumes into the station from local bus and walk are reduced slightly, suggesting some trips can use another London Overground rail station as their initial boarding point before interchanging at Old Oak Common. Conversely, volumes out of the station entrance increase, driven by London Overground passengers, suggesting that a combination of London Overground and bus services at Old Oak Common is attractive to some movements.
- 6.10.17 It is worth noting that interchange movements changing service but using the same platform make up 16% of the total station matrix, including a substantial number at the London Overground single-island northbound and southbound platform.
- 6.10.18 The impact on local buses is as expected. The only route impacted is Route 72 which is the primary north-south route serving Old Oak Common. Along this route the introduction of a north-south rail service at Old Oak Common reduces bus loading from 80% to 55% on some sections of the route.

Impact on crowding

- 6.10.19 The impacts of the Overground connectivity test on crowding are extremely limited with no impacts apparent on the LU network and minor impacts, in terms of an increase from <1 passenger per square metre (PPSM) to 1-2 PPSM on northbound NLL services between South Acton and Willesden Junction. This is reflected in Figure 6-235 and Figure 6-236 for network crowding.
- 6.10.20 No line by line graphs are reproduced for this sensitivity test due to the limited crowding impacts.

Journey time impacts to HS2 passengers

- 6.10.21 An analysis of travel time savings was undertaken for HS2 passengers based on weighted passenger hours comprising in-vehicle time, access and egress time, interchange time, wait time, boarding time and a time penalty to represent crowding. This estimated the difference in weighted passenger hours between the Phase Two HS2 operations in 2041 and for each of the sensitivity tests. This indicates that between 07:00 and 10:00, HS2 passengers are forecast to save a total of nearly 930 weighted hours as a result of Overground connectivity at Old Oak Common, mainly brought about by improved access to Old Oak Common station.

Summary

- 6.10.22 The inclusion of a London Overground connection at Old Oak Common would lead to around 10% less HS2 passengers using Euston, but with a negligible reduction in LU crowding. Old Oak Common station would become a more accessible station to HS2 passengers, with additional areas of southwest, west and northwest London connected directly to the new Overground station, and hence the Proposed Scheme.

Crossrail 1 services to/from the WCML

Scheme details

- 6.10.23 This scheme would provide a link between the GWML and WCML, allowing Crossrail services access to destinations on the WCML, and would replace some of the London Midland services that currently run into Euston. This would have the effect of reducing the number of 'classic' passengers heading into Euston and transferring to the Underground, freeing up space for HS2 arrivals. The scheme was identified in the Network Rail London and South East Rail Utilisation Strategy (2011).
- 6.10.24 This scenario extends eight Crossrail trains per hour from Old Oak Common onto the West Coast Main Line replacing certain London Midland services to/from London Euston. All Crossrail 1 trains operating to/from the WCML are assumed to call at Old Oak Common. Services provided across the three hour morning peak are set out in Table 6-339 for south eastbound services. Calling patterns for these services are:
- semi fasts call at Berkhamsted, Hemel Hempstead, Watford Junction, Old Oak Common, Paddington and all Crossrail stations east of Paddington;
 - semi slows call at Berkhamsted, Hemel Hempstead, Apsley, Kings Langley, Watford Junction, Old Oak Common, Paddington and all Crossrail stations east of Paddington; and
 - stopping services call at Bushey, Harrow & Wealdstone, Wembley Central, Old Oak Common, Paddington and all Crossrail stations east of Paddington.

Table 6-339: Crossrail south/eastbound services

No	Origin	Destination	Trains/three hours	Calling pattern	Comment
1	Tring	Abbey Wood	6	semi fast	-
2	Tring	Abbey Wood	6	semi slow	-
4	Watford Junction	Shenfield	12	stopping	-
5	Old Oak Common	Abbey Wood	6	NA	18 in future baseline plus operation
6	Old Oak Common	Shenfield	6	NA	

- 6.10.25 London Midland Southbound residual services are assumed to be:
- one train per hour from Milton Keynes plus one train per hour from Bletchley to Euston calling all stations to Hemel Hempstead, Watford Junction and Harrow Wealdstone; and
 - the other trains in the peak period which run non-stop south of Leighton Buzzard, or call just at Berkhamsted or Watford Junction are unchanged.
- 6.10.26 Services provided across the three hour morning peak are set out in Table 6-340 for north and westbound services. Calling patterns for these services are as in the opposite direction.

Table 6-340: Crossrail west/northbound services

No	Origin	Destination	Trains per peak period (tppp)	Calling pattern	Comment
1	Abbey Wood	Tring	6	semi fast	-
2	Abbey Wood	Tring	6	semi slow	-
3	Shenfield	Watford Junction	12	stopping	-
4	Abbey Wood	Old Oak Common	6	NA	18 in future baseline plus operation
5	Shenfield	Old Oak Common	6	NA	

6.10.27 London Midland northbound residual services are assumed to be:

- one train per hour Euston to Milton Keynes plus one train per hour Euston to Bletchley calling stations as in the opposite direction; and
- the hourly faster services which make limited stops, e.g. Watford Junction, Berkhamsted, Leighton Buzzard and Milton Keynes are unchanged.

6.10.28 The following services were assumed to be unchanged:

- Southern services via the West London Line;
- the longer distance faster London Midland services that stop south of Leighton Buzzard at most at Berkhamsted and Watford Junction; and
- Crossrail services that run to destinations on the Great Western Main Line.

6.10.29 No separate LTS run was undertaken for this sensitivity; all impacts identified are therefore the result of reassignment within Railplan.

Comparison with 2041 AM Proposed Scheme

Station demand

6.10.30 Table 6-341 shows minor impacts on the balance of HS2 flows between Euston and Old Oak Common. However, there is a substantial reduction in boarding and alighting NR suburban passenger at Euston of 1,600 and 8,910 respectively. At Old Oak Common, there are reductions in boarding passengers of 4,580 on eastbound NR slow services and reductions in alighting passengers of 2,900 from eastbound NR fast services. These changes are a direct result of the Crossrail connections to the WCML offering alternatives to services from both Euston and Old Oak Common.

Table 6-341: 2041 AM Euston station demand, 07:00-10:00

Description	Future baseline plus operation 2041 AM			Crossrail 1 to/from WCML sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (down)	4,074	-	4,074	2,453	-	2,453
Euston suburban (up)	-	24,608	24,608	-	15,693	15,693
Euston inter-city (down)	2,335	-	2,335	2,256	-	2,256
Euston inter-city/other (up)	-	7,126	7,126	-	7,030	7,030
Euston HS2 (up)	-	24,666	24,666	-	24,917	24,917
Euston HS2 (down)	18,269	-	18,269	18,006	-	18,006
Sub-total: Euston NR	24,678	56,400	81,078	22,715	47,640	70,355
Euston LU						
Euston Northern (Charing Cross northbound)	2,333	4,239	6,572	2,280	4,193	6,473
Euston Northern (Charing Cross southbound)	9,092	2,550	11,642	7,436	2,492	9,928
Euston Northern (Bank northbound)	4,174	3,819	7,993	4,136	3,661	7,797
Euston Northern (Bank southbound)	9,237	8,241	17,478	7,520	8,123	15,643
Euston Victoria (northbound)	3,616	9,924	13,540	3,488	9,785	13,273
Euston Victoria (southbound)	12,892	5,338	18,230	11,700	5,175	16,875
Sub-total: Euston LU	41,344	34,111	75,455	36,560	33,429	69,989
Euston Square LU						
Euston Square Met (northbound/westbound)	3,590	8,878	12,468	2,949	8,680	11,629
Euston Square Met (southbound/eastbound)	11,850	8,301	20,151	10,921	8,186	19,107
Sub-total: Euston Square LU	15,440	17,179	32,619	13,870	16,866	30,736
Old Oak Common						
Old Oak Common NR slow down	4,022	10,179	14,201	5,149	10,185	15,334
Old Oak Common NR slow up	25,271	7,907	33,178	20,688	8,523	29,211
Old Oak Common NR fast down	7,284	0	7,284	7,543	0	7,543
Old Oak Common NR fast up	-	17,371	17,371	-	14,474	14,474
Old Oak Common HS2 up	-	9,477	9,477	-	9,226	9,226
Old Oak Common HS2 down	7,956	-	7,956	8,218	-	8,218
Sub-total: Old Oak Common	44,533	44,934	89,467	41,598	42,408	84,006

Demand at other stations

- 6.10.31 Table 6-342 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.
- 6.10.32 Connecting Crossrail to the WCML results in substantial increases of 11% and 5% in eastbound and westbound Crossrail flows respectively, with increases in access, egress and interchange at Bond Street and Paddington. The corresponding reduction in station usage at Euston (<9,000 fewer access, egress and interchange trips) is a direct result of passengers interchanging with Crossrail elsewhere, such as at Bond Street, Farringdon and Paddington.

Table 6-342: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	Future baseline plus operation 2041 AM	Crossrail 1 to/from WCML sensitivity test 2041 AM	Absolute difference	% difference
Bond Street	67,789	70,748	2,959	4%
Paddington	60,043	62,807	2,764	5%
Farringdon	70,401	70,642	241	0%
Liverpool Street	123,449	123,632	183	0%
Angel	19,813	19,943	130	1%
King's Cross	55,929	56,053	124	0%
Lancaster Gate	2,053	2,158	105	5%
City Thameslink	21,842	21,742	-100	0%
Marble Arch	6,616	6,515	-101	-2%
London Bridge	171,504	171,352	-152	0%
Great Portland Street	13,473	13,316	-157	-1%
St Pancras	20,227	20,062	-165	-1%
Oxford Circus	86,079	85,897	-182	0%
Victoria	146,426	146,233	-193	0%
Tottenham Court Road	48,051	47,808	-243	-1%
Green Park	56,147	55,888	-259	0%
Leicester Square	27,444	27,044	-400	-1%
Bank	98,244	97,714	-530	-1%
Moorgate	35,533	34,988	-545	-2%
Baker Street	40,198	39,460	-738	-2%
Euston (inc. Euston Square)	114,718	104,773	-9,945	-9%
Sub-total	1,285,979	1,278,775	-7,204	-1%

Station	Future baseline plus operation 2041 AM	Crossrail 1 to/from WCML sensitivity test 2041 AM	Absolute difference	% difference
Total (all Zone 1)	20,88,562	2,081,379	-7,183	0%
Camden Town	18,390	18,397	7	0%
Mornington Crescent	2,922	2,917	-5	0%
Ealing Broadway	29,884	30,052	168	1%

Impact on flows

- 6.10.33 Table 6-343 and Figure 6-237 to Figure 6-239 show the passenger flow impact of Crossrail 1 services to/from the WCML. The LU network shows substantial reductions on the eastbound Northern Line Bank branch between Euston and Bank, the eastbound sub-surface lines between Euston and Moorgate and the southbound Northern Line Charing Cross branch and Victoria Lines from Euston towards Tottenham Court Road and Oxford Circus respectively.
- 6.10.34 On NR, connecting Crossrail to the WCML results in a substantial increase in eastbound and westbound Crossrail flows, starting at Old Oak Common with an increase in passengers west of Old Oak Common of some 10,600 but decreasing steadily towards Liverpool Street with the increase reducing to around 1,800 passengers. There is a corresponding reduction in southbound WCML flows into Euston of around 9,000 passengers.
- 6.10.35 Flow changes on other NR services or buses are negligible.

Table 6-343: 2041 network impacts, AM peak period

Services		Future baseline plus operation 2041 AM	Crossrail 1 to WCML sensitivity test 2041 AM	% difference
Euston Classic suburban	Inbound	24,608	15,693	-36%
	Outbound	4,074	2,453	-40%
Euston Classic inter-city	Inbound	7,126	7,030	-1%
	Outbound	2,335	2,256	-3%
HS2 at Euston	Inbound	24,666	24,917	1%
	Outbound	18,269	18,006	-1%
HS2 at Old Oak Common	Inbound	34,143	34,143	0%
	Outbound	26,224	26,224	0%
Sub-total at Euston	Inbound	56,400	47,640	-16%
	Outbound	24,678	22,715	-8%
Victoria Line, north of Euston	Northbound	26,527	26,265	-1%
	Southbound	66,699	67,006	0%
Victoria Line, south of Euston	Northbound	32,834	32,561	-1%

Services		Future baseline plus operation 2041 AM	Crossrail 1 to WCML sensitivity test 2041 AM	% difference
	Southbound	74,254	73,532	-1%
Northern Line (Bank branch), north of Euston	Northbound	21,444	21,419	0%
	Southbound	39,027	39,242	1%
Northern Line (Bank branch), south of Euston	Northbound	21,088	20,944	-1%
	Southbound	40,022	38,639	-3%
Northern Line (Charing Cross branch), north of Euston	Northbound	12,629	12,558	-1%
	Southbound	35,810	35,822	0%
Northern Line (Charing Cross branch), south of Euston	Northbound	14,535	14,471	0%
	Southbound	42,352	40,766	-4%
Metropolitan/Hammersmith & City, Circle Line (west of Euston Square)	Eastbound	35,855	35,981	0%
	Westbound	33,379	32,794	-2%
Metropolitan/Hammersmith & City, Circle Line (east of Euston Square)	Eastbound	39,404	38,716	-2%
	Westbound	38,667	38,526	0%
GWML slow/Crossrail (Acton Main Line to Old Oak Common)	Eastbound	31,491	31,466	0%
	Westbound	14,042	14,492	3%
Crossrail Old Oak Common to Paddington	Eastbound	47,386	52,683	11%
	Westbound	20,200	21,136	5%
Crossrail Paddington to Bond Street	Eastbound	52,175	58,599	12%
	Westbound	25,415	26,139	3%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,722	47,088	8%
	Southbound	43,822	44,420	1%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,165	1,164	0%
	Southbound	1,596	1,581	-1%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	3,013	3,004	0%
	Westbound	3,995	3,992	0%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	18,113	20,903	15%
	Westbound	7,783	7,521	-3%
GWML slow (Old Oak Common to Paddington ML)	Eastbound	1,469	1,551	6%
	Westbound	0	0	0%

Figure 6-237: LU flow differences 2041 AM peak Crossrail 1 to WCML

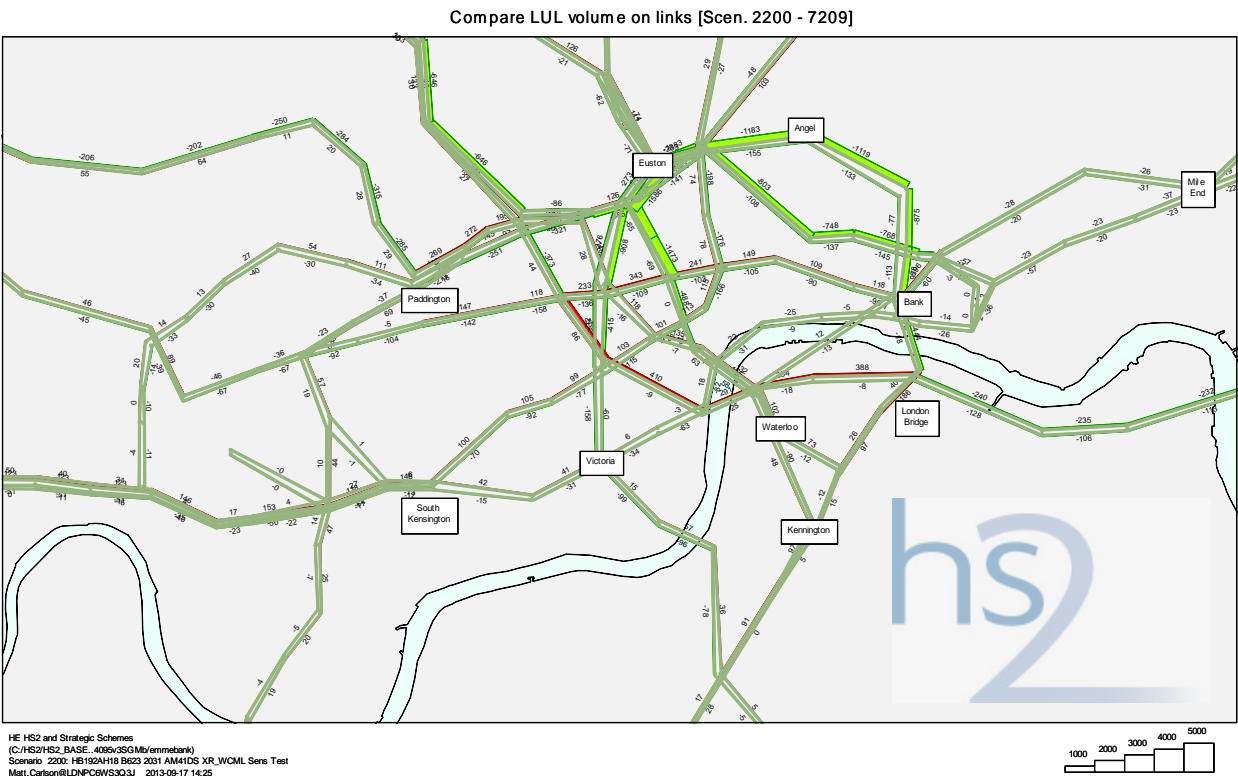


Figure 6-238: NR flow differences 2041 AM peak Crossrail 1 to WCML

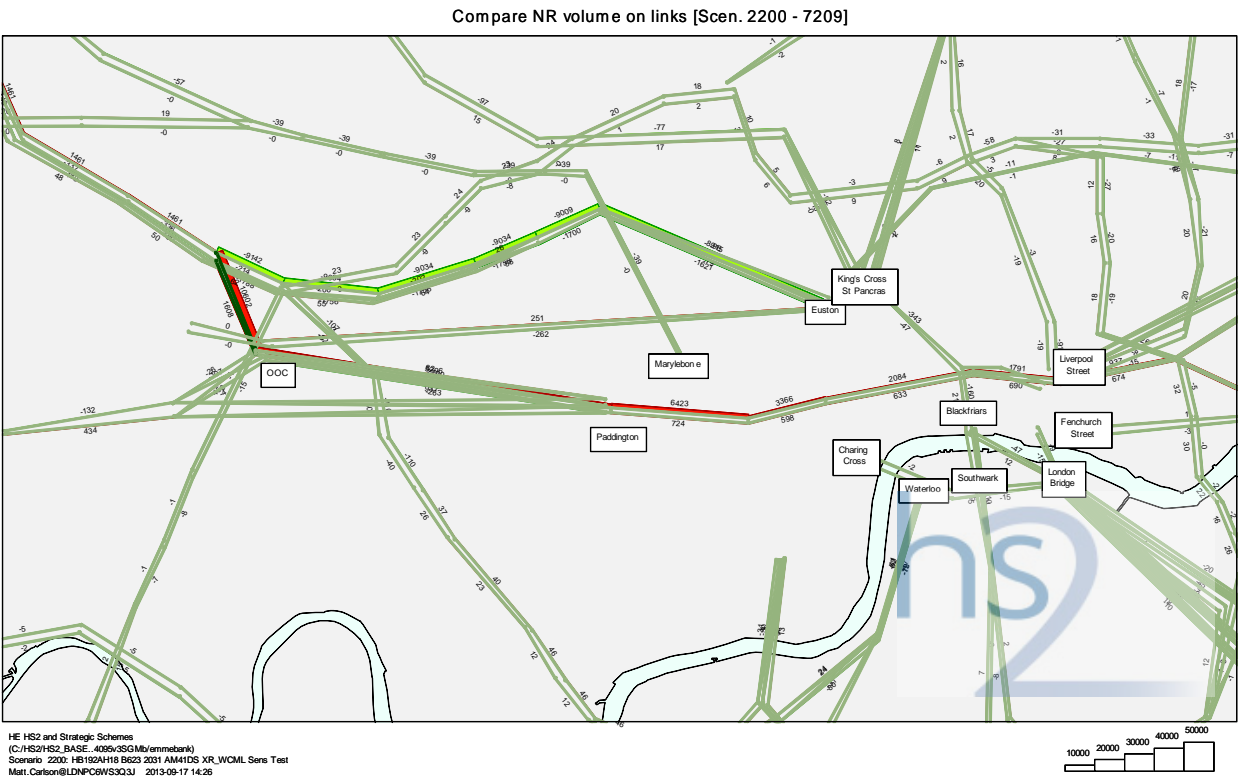
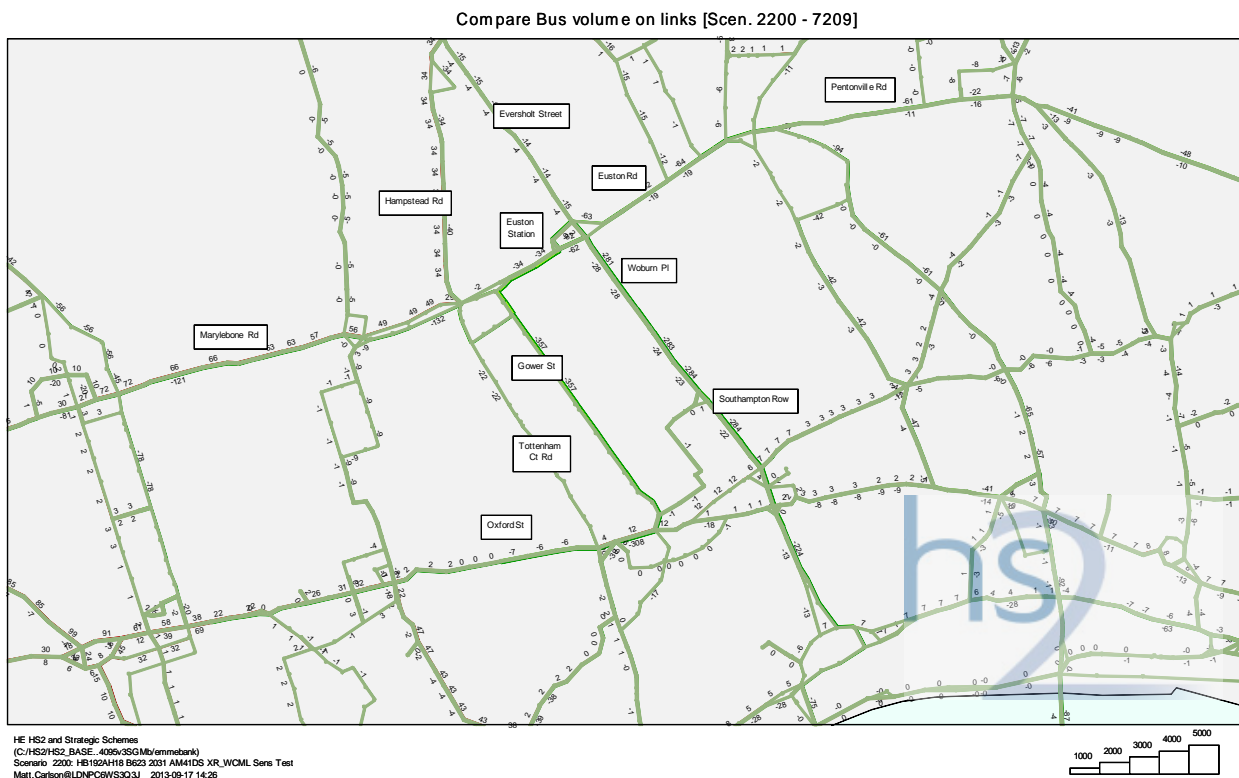


Figure 6-239: Bus flow differences 2041 AM peak Crossrail 1 to WCML



Impacts at Old Oak Common

- 6.10.36 Old Oak Common sees a small but notable decrease in overall interchange movements with Crossrail 1 services to/from the WCML. The majority of this is caused by a reduction in the number of movements between eastbound main line GWML services and eastbound relief line (Crossrail) services. This impact is expected as Crossrail services will arrive at Old Oak Common carrying substantially higher numbers of passengers, so crowding will discourage such movements.
- 6.10.37 The level of crowding on Crossrail services also explains the small decrease in passengers entering the station, as Crossrail is a less attractive option. The increase in the number of people leaving the station can be attributed to the increase in the absolute number of passengers passing through, some of which will benefit from Old Oak Common bus connections.
- 6.10.38 It is worth noting that interchange movements changing service but using the same platform reduce, particularly on the eastbound Crossrail platform, owing again to the increased crowding levels on Crossrail trains.
- 6.10.39 The impact on local buses is minor. The most affected route, Route 487, which runs roughly to the northwest of Old Oak Common, sees minor reductions in loadings of around 5-10 percentage points as some short journeys to/from the Old Oak Common area can be made using the Crossrail WCML services.

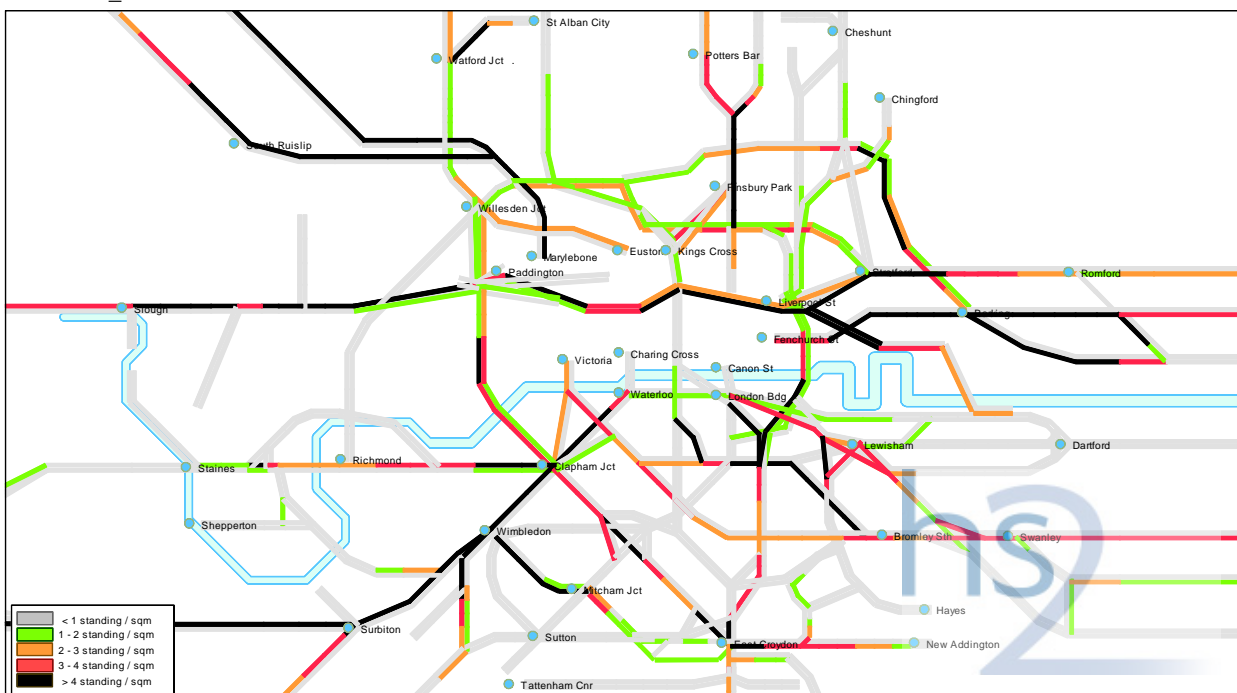
Impact on crowding

6.10.40 The crowding impacts of the Crossrail 1 services to/from the WCML test is shown for NR and LU in Figures 9 and 10 and on the Northern Line and Crossrail in Figures 11 to 13. This indicates that crowding is mainly confined to:

- some increases on the central section of Crossrail of around 0.3 PPSM eastbound towards Bond Street; and
- reductions in crowding on the northbound Northern Line Bank and Charing Cross branches from >4 PPSM to 3-4 PPSM.

Figure 6-240: NR crowding 2041 AM peak Crossrail 1 to WCML

National Rail and Tramlink Crowding
Crowded_HB192AH18: Scenario 2250



Note:
- Peak hour crowding (54% peak period demand)
- Standing density factor of 7 pax/sqm
- Includes reliability factor

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Transport for London 

Figure 6-241: LU crowding 2041 AM peak Crossrail 1 to WCML

LUL and DLR Crowding

Crowded_HB192AH18: Scenario 2250

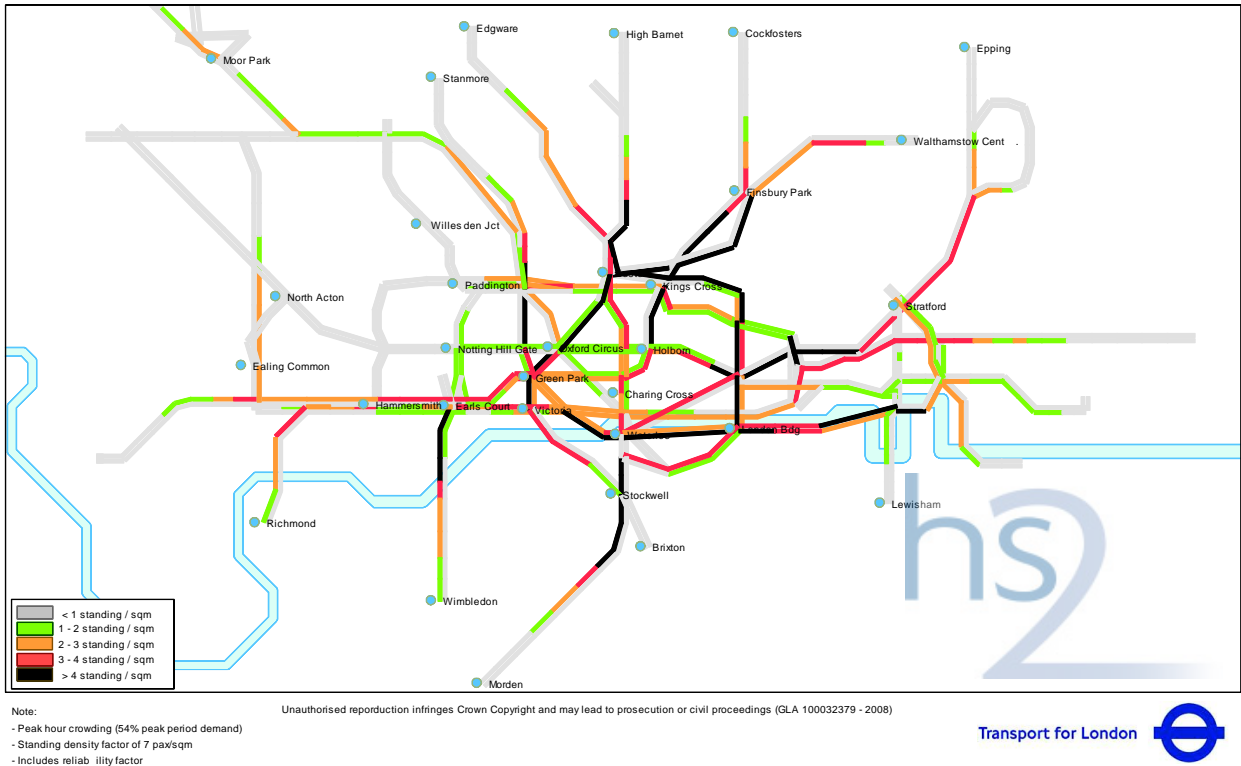


Figure 6-242: Line crowding AM 2041

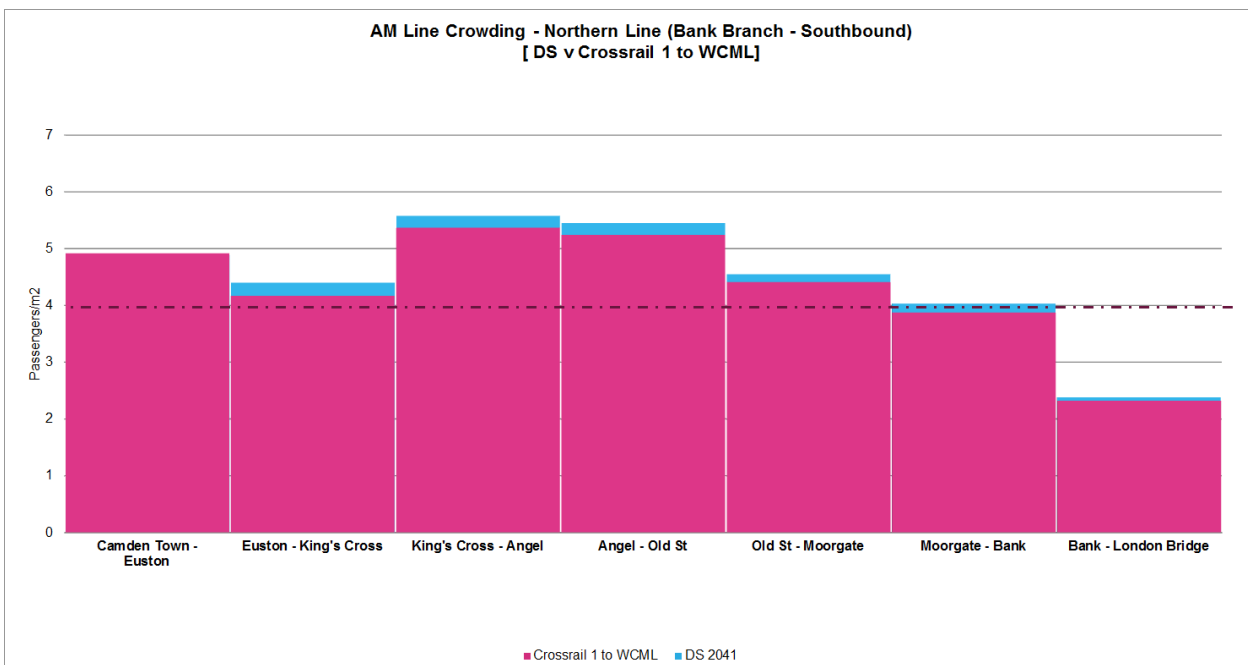
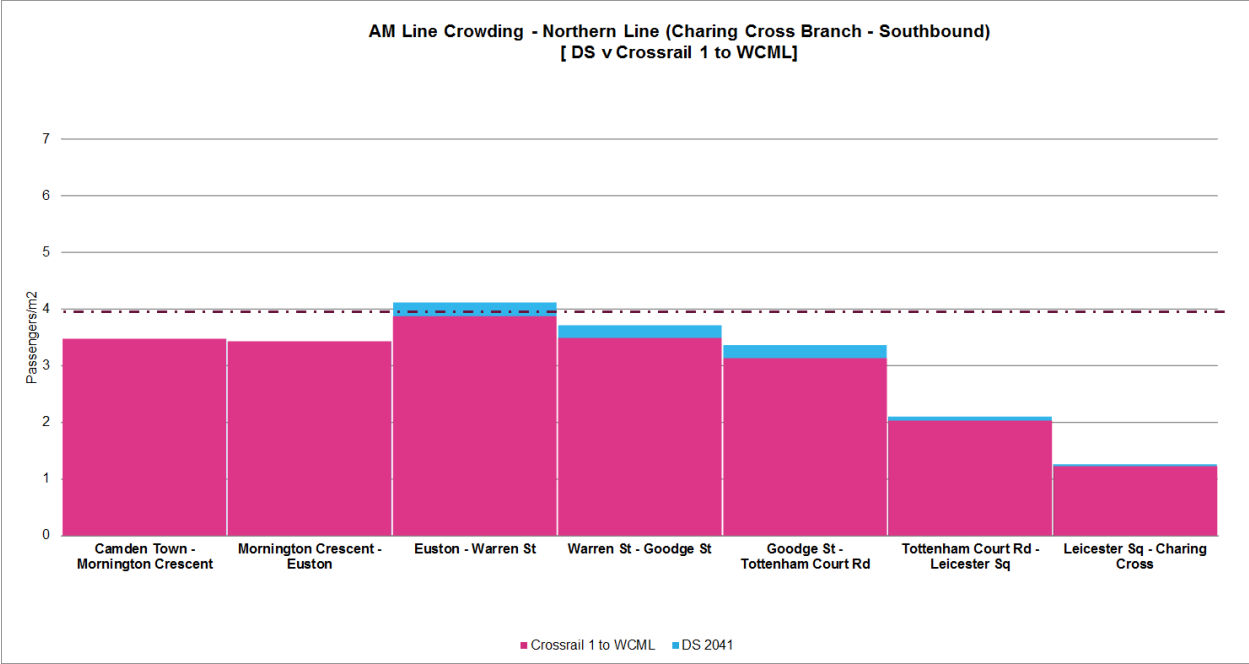
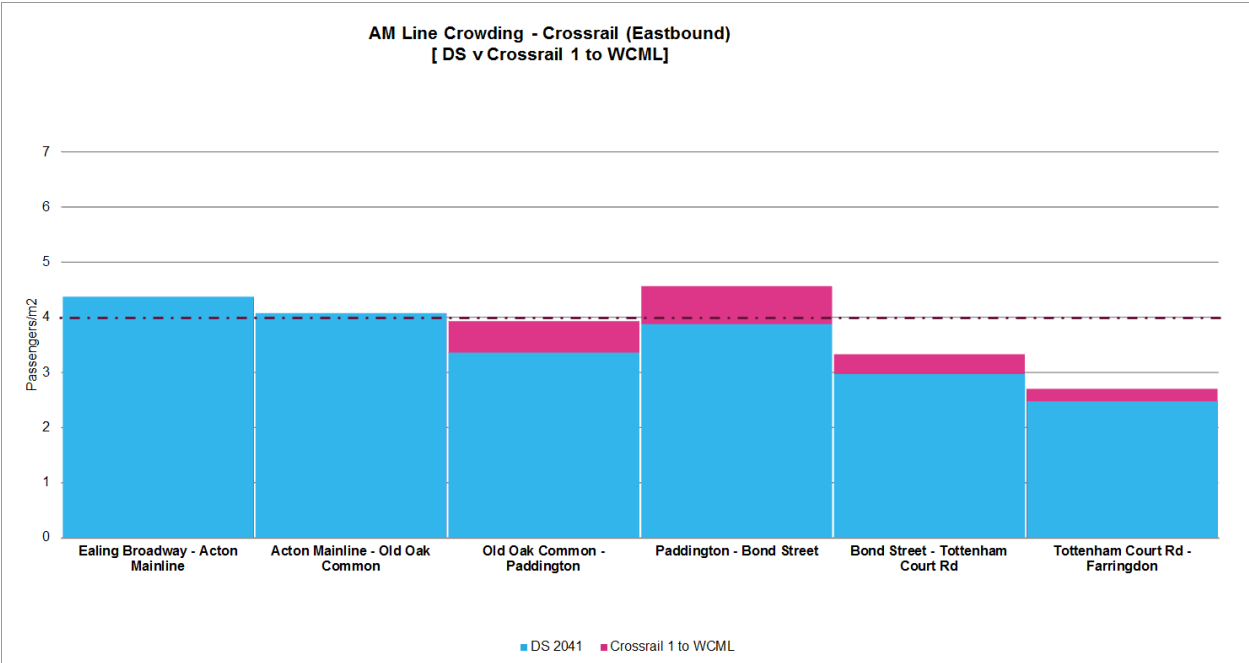


Figure 6-243: Line crowding AM 2041



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Figure 6-244: Line crowding AM 2041



Journey time impacts to HS2 passengers

6.10.41 There would be only a negligible reduction in weighted journey times for HS2 passengers resulting from Crossrail 1 to the WCML. The main beneficiaries of the scheme would be passengers currently using London Midland services to access Euston. HS2 passengers would benefit indirectly, with fewer 'classic' passengers using Euston.

Summary

- 6.10.42 The inclusion of a Crossrail link to WCML would lead to around 30% less 'classic' passengers arriving at Euston in the AM peak, with a notable reduction in LU crowding. However, crowding on Crossrail services would increase and there is the potential that there would be insufficient capacity to accommodate HS2 passengers starting at Old Oak Common station.

Crossrail 2

Scheme details

- 6.10.43 Crossrail 2 is being promoted by TfL and NR as one of the key long-term projects needed to support growth in London. Public consultation was undertaken between May and 31st August 2013 on two options: a Metro option and a Regional option which includes the Metro option but with extensions northwards into Hertfordshire and southwards into southwest London and Surrey. This sensitivity test assumes the Regional option.
- 6.10.44 The service pattern for the Regional option is set out in Table 6-344, resulting in 30 tph in each direction through the core section Wimbledon-Tooting Broadway-Clapham Junction-Kings Road Chelsea Victoria-Tottenham Court Road-Euston/St Pancras-Angel.
- 6.10.45 The likely trip generation, redistribution and modal shift impacts of Crossrail 2 meant that a run of LTS was required.

Table 6-344: Crossrail 2 service pattern - tph in each direction

From	To	tph in each direction
Kingston	Alexandra Palace	4
Twickenham	Alexandra Palace	4
Shepperton	Alexandra Palace	4
Epsom	Alexandra Palace	4
Chessington South	Alexandra Palace	2
Wimbledon	Broxbourne	6
Hampton Court	Alexandra Palace	2
Chessington South	Hertford East	2
Hampton Court	Hertford East	2
Total		30

Comparison with 2041 AM Proposed Scheme

Station demand

- 6.10.46 Table 6-345 shows that Crossrail 2 has a small impact on the balance of HS2 flow between Euston and Old Oak Common with an increase of 820 boarders and 350 alighters at Euston at the expense of Old Oak Common in the 3 hour peak period. The reduction in boarders and alighters to/from LU at Euston is due to the general transfer of demand in central London from LU to Crossrail 2.

Table 6-345: 2041 AM Euston station demand, 07:00-10:00

Description	Future baseline plus operation 2041 AM			Crossrail 2 sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (down)	4,074	-	4,074	4,945	-	4,945
Euston suburban (up)	-	24,608	24,608	-	24,967	24,967

Description	Future baseline plus operation 2041 AM			Crossrail 2 sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston inter-city (down)	2,335	-	2,335	2,365	-	2,365
Euston inter-city/other (up)	-	7,126	7,126	-	7,124	7,124
Euston HS2 (up)	-	24,666	24,666	-	25,046	25,046
Euston HS2 (down)	18,269	-	18,269	19,094	-	19,094
Sub-total: Euston NR	24,678	56,400	81,078	26,404	57,137	83,541
Euston LU						
Euston Northern (Charing Cross northbound)	2,333	4,239	6,572	3,134	2,437	5,571
Euston Northern (Charing Cross southbound)	9,092	2,550	11,642	7,755	2,965	10,720
Euston Northern (Bank northbound)	4,174	3,819	7,993	5,125	3,585	8,710
Euston Northern (Bank southbound)	9,237	8,241	17,478	9,061	9,321	18,382
Euston Victoria (northbound)	3,616	9,924	13,540	2,919	7,289	10,208
Euston Victoria (southbound)	12,892	5,338	18,230	14,060	4,639	18,699
Sub-total: Euston LU	41,344	34,111	75,455	42,054	30,236	72,290
Euston Square LU						
Euston Square Met (northbound/westbound)	3,590	8,878	12,468	3,955	8,039	11,994
Euston Square Met (southbound/eastbound)	11,850	8,301	20,151	11,592	8,369	19,961
Sub-total: Euston Square LU	15,440	17,179	32,619	15,547	16,408	31,955
Old Oak Common						
Old Oak Common NR slow down	4,022	10,179	14,201	4,002	10,392	14,394
Old Oak Common NR slow up	25,271	7,907	33,178	25,354	7,665	33,019
Old Oak Common NR fast down	7,284	0	7,284	7,985	0	7,985
Old Oak Common NR fast up	-	17,371	17,371	-	17,677	17,677
Old Oak Common HS2 up	-	9,477	9,477	-	9,097	9,097
Old Oak Common HS2 down	7,956	-	7,956	7,131	-	7,131
Sub-total: Old Oak Common	44,533	44,934	89,467	44,472	44,831	89,303

Demand at other stations

6.10.47 Table 6-346 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.

6.10.48 Crossrail 2 has a profound impact on station activity at those stations in central London that it serves with Tottenham Court Road the largest increase at over 70,000 passengers (+150%) during the AM peak period, followed by Angel (+12,940) and Euston/St Pancras (+10,570, an increase of 9%). At Euston, the increase is likely to be between the LU lines and Crossrail 2 as HS2 flows into Euston increase only slightly by around 380 passengers.

6.10.49 A large number of Zone 1 stations experience a reduction in station activity due to the attractiveness of Crossrail 2 with the largest reductions at Oxford Circus, King's Cross, Bank, Liverpool St and Waterloo, due to lower levels of passengers on most of the LU network.

Table 6-346: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	Future Baseline plus Operation	Crossrail 2 sensitivity test	Absolute difference	% difference
Tottenham Court Road	48,051	120,456	72,405	151%
Angel	19,813	32,757	12,944	65%
Euston (inc. Euston Square)	114,718	125,289	10,571	9%
St Pancras	20,227	23,199	2,972	15%
Victoria	146,426	148,713	2,287	2%
Chancery Lane	16,417	17,891	1,474	9%
Green Park	56,147	57,275	1,128	2%
Borough	6,637	7,342	705	11%
Marble Arch	6,616	7,176	560	8%
Temple	21,422	21,959	537	3%
Tower Hill	15,543	16,063	520	3%
Mansion House	2,675	2,991	316	12%
Marylebone	23,414	23,643	229	1%
Queensway	3,247	3,457	210	6%
Edgware Road (Bakerloo)	992	1,159	167	17%
St Paul's	2,562	2,712	150	6%
Lambeth North	2,896	3,025	129	4%
Bayswater	2,212	2,086	-126	-6%
Fenchurch Street	36,414	36,286	-128	0%
Monument	6,319	6,190	-129	-2%
Aldgate	15,337	15,178	-159	-1%
Barbican	7,783	7,557	-226	-3%
Edgware Road (SSL)	7,186	6,937	-249	-3%
Notting Hill Gate	11,917	11,567	-350	-3%

Station	Future Baseline plus Operation	Crossrail 2 sensitivity test	Absolute difference	% difference
Russell Square	8,235	7,843	-392	-5%
Hyde Park Corner	3,823	3,417	-406	-11%
Westminster	26,650	26,223	-427	-2%
Regent's Park	5,501	5,005	-496	-9%
Knightsbridge	12,562	11,937	-625	-5%
Old Street	21,263	20,527	-736	-3%
Gloucester Road	12,176	11,429	-747	-6%
London Bridge	171,504	170,668	-836	0%
Embankment	29,944	29,001	-943	-3%
Moorgate	35,533	34,487	-1,046	-3%
St James's Park	18,632	17,566	-1,066	-6%
City Thameslink	21,842	20,771	-1,071	-5%
Pimlico	15,642	14,561	-1,081	-7%
Baker Street	40,198	39,082	-1,116	-3%
Great Portland Street	13,473	12,307	-1,166	-9%
Elephant & Castle	22,651	21,275	-1,376	-6%
Charing Cross	41,480	40,088	-1,392	-3%
Farringdon	70,401	68,919	-1,482	-2%
Warren Street	16,929	15,404	-1,525	-9%
Bond Street	67,789	65,873	-1,916	-3%
Blackfriars	28,725	26,688	-2,037	-7%
Sloane Square	12,696	10,656	-2,040	-16%
Holborn	33,486	31,421	-2,065	-6%
Cannon Street	44,322	42,218	-2,104	-5%
Piccadilly Circus	18,072	15,918	-2,154	-12%
Paddington	60,043	57,863	-2,180	-4%
South Kensington	25,741	22,676	-3,065	-12%
Goodge Street	21,091	17,423	-3,668	-17%
Leicester Square	27,444	22,756	-4,688	-17%
Oxford Circus	86,079	80,187	-5,892	-7%
King's Cross	55,929	49,725	-6,204	-11%

Station	Future Baseline plus Operation	Crossrail 2 sensitivity test	Absolute difference	% difference
Bank	98,244	91,995	-6,249	-6%
Liverpool Street	123,449	112,255	-11,194	-9%
Waterloo	144,306	118,275	-26,031	-18%
Sub-total	2,030,826	2,037,347	6,521	0%
Total (all Zone 1)	2,088,562	2,094,943	6,381	0%
Camden Town	18,390	17,966	-424	-2%
Mornington Crescent	2,922	2,774	-148	-5%
Ealing Broadway	29,884	29,111	-773	-3%

Impact on flows

- 6.10.50 Table 6-347 and Figure 6-245 to Figure 6-247 show the passenger flow impact of Crossrail 2 compared with the future baseline plus operation. The LU network shows substantial reductions on all south-north lines with the greatest impacts on the southbound and northbound Victoria Line south of Euston (-12,000 and -8,500 respectively), the southbound Northern Line Charing Cross branch south of Euston (-3,100) and the westbound sub-surface lines from Euston Square (-3,500). The only flow increases on the LU network are on the westbound and eastbound Central Line towards Tottenham Court Road (-3,300 in both directions) which acts as a feeder to Crossrail 2.
- 6.10.51 This is reflected in the changes on NR, where Crossrail 2 attracts some 75,000 passengers northbound and 50,000 passengers southbound through central London. There are corresponding reductions in flow on NR services into Victoria and Waterloo (-25,000) and Liverpool Street (-11,000).
- 6.10.52 There are substantial flow reductions forecast on bus routes paralleling Crossrail 2, particularly Theobalds Road/Rosebery Avenue and Charing Cross Road/Shafesbury Avenue, but also on roads around Euston including Gower Street, Euston Road, Hampstead Road, City Road and Woburn Place with flow reductions of around 1,500 passengers westbound along Euston Road.

Table 6-347: 2041 network impacts, AM peak period

Services		Future baseline plus operation 2041 AM	Crossrail 2 sensitivity test 2041 AM	% difference
Euston Classic suburban	Inbound	24,608	24,967	1%
	Outbound	4,074	4,945	21%
Euston Classic inter-city	Inbound	7,126	7,124	0%
	Outbound	2,335	2,365	1%
HS2 at Euston	Inbound	24,666	25,046	2%
	Outbound	18,269	19,094	5%
HS2 at Old Oak Common	Inbound	34,143	34,143	0%

Services		Future baseline plus operation 2041 AM	Crossrail 2 sensitivity test 2041 AM	% difference
	Outbound	26,224	26,224	0%
Sub-total at Euston	Inbound	56,400	57,137	1%
	Outbound	24,678	26,404	7%
Victoria Line, north of Euston	Northbound	26,527	19,924	-25%
	Southbound	66,699	52,757	-21%
Victoria Line, south of Euston	Northbound	32,834	24,293	-26%
	Southbound	74,254	62,178	-16%
Northern Line (Bank branch), north of Euston	Northbound	21,444	22,085	3%
	Southbound	39,027	39,161	0%
Northern Line (Bank branch), south of Euston	Northbound	21,088	20,545	-3%
	Southbound	40,022	38,902	-3%
Northern Line (Charing Cross branch), north of Euston	Northbound	12,629	13,853	10%
	Southbound	35,810	34,487	-4%
Northern Line (Charing Cross branch), south of Euston	Northbound	14,535	13,156	-9%
	Southbound	42,352	39,277	-7%
Metropolitan/Hammersmith & City, Circle Line (west of Euston Square)	Eastbound	35,855	35,901	0%
	Westbound	33,379	31,023	-7%
Metropolitan/Hammersmith & City, Circle Line (east of Euston Square)	Eastbound	39,404	39,124	-1%
	Westbound	38,667	35,107	-9%
GWML slow/Crossrail (Acton Main Line to Old Oak Common)	Eastbound	31,491	31,160	-1%
	Westbound	14,042	14,999	7%
Crossrail Old Oak Common to Paddington	Eastbound	47,386	47,440	0%
	Westbound	20,200	21,389	6%
Crossrail Paddington to Bond Street	Eastbound	52,175	51,912	-1%
	Westbound	25,415	27,646	9%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,722	43,480	-1%
	Southbound	43,822	44,527	2%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,165	1,025	-12%
	Southbound	1,596	1,337	-16%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	3,013	2,696	-11%
	Westbound	3,995	3,819	-4%

Services		Future baseline plus operation 2041 AM	Crossrail 2 sensitivity test 2041 AM	% difference
GWML fast (Old Oak Common to Paddington IC)	Eastbound	18,113	17,445	-4%
	Westbound	7,783	7,323	-6%
GWML slow (Old Oak Common to Paddington ML)	Eastbound	1,469	1,408	-4%
	Westbound	0	0	0%

Figure 6-245: LU flow differences 2041 AM peak Crossrail 2

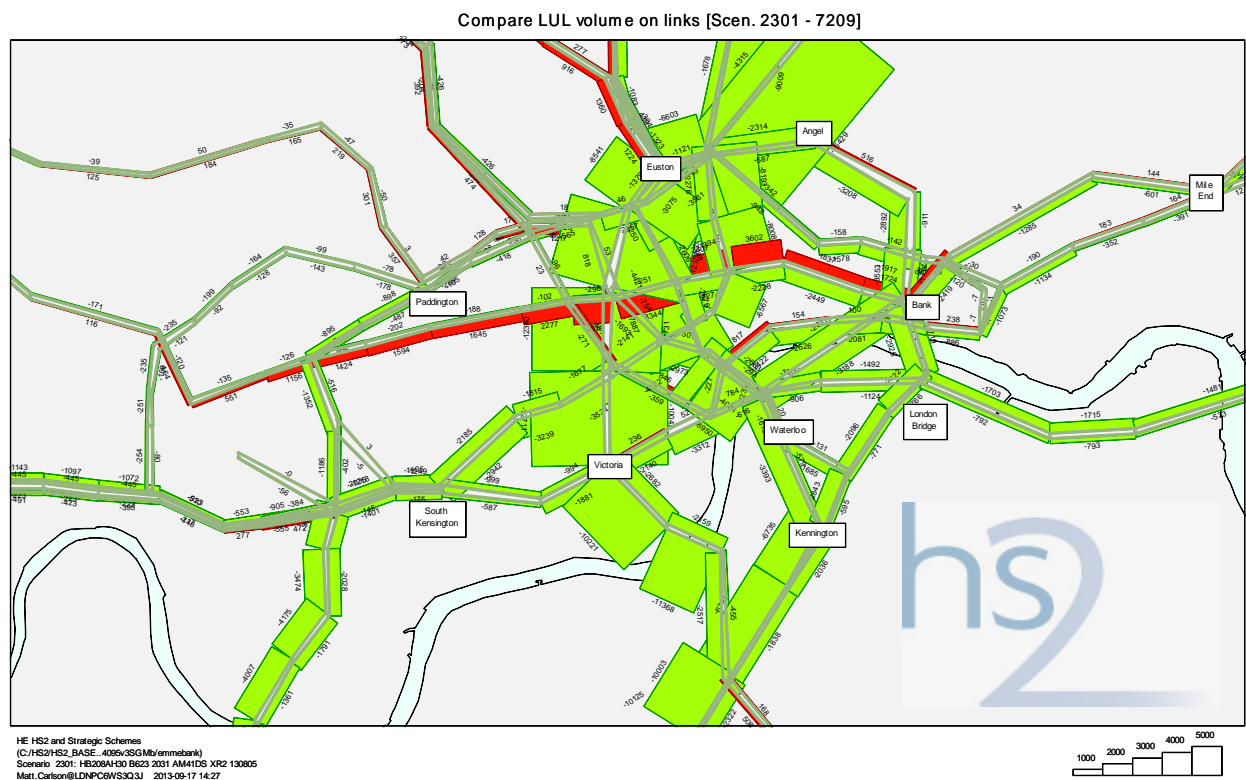


Figure 6-246: NR flow differences 2041 AM peak Crossrail 2

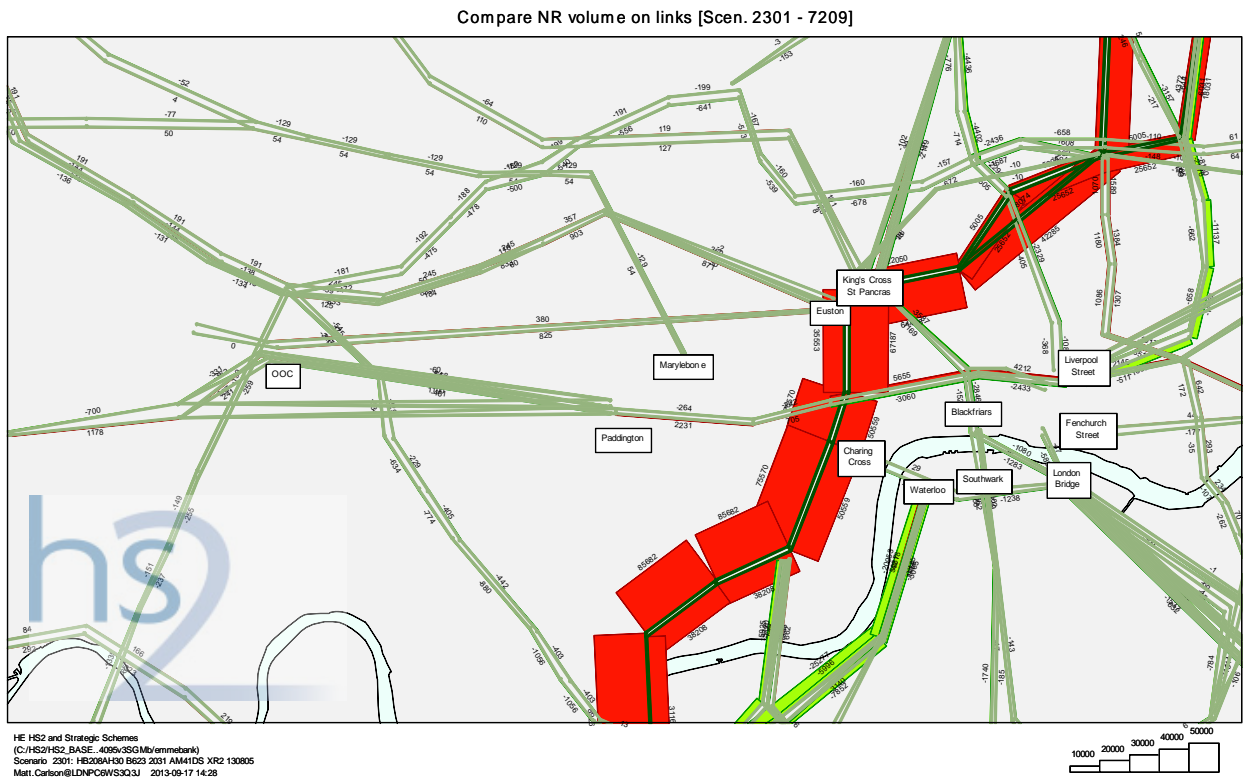
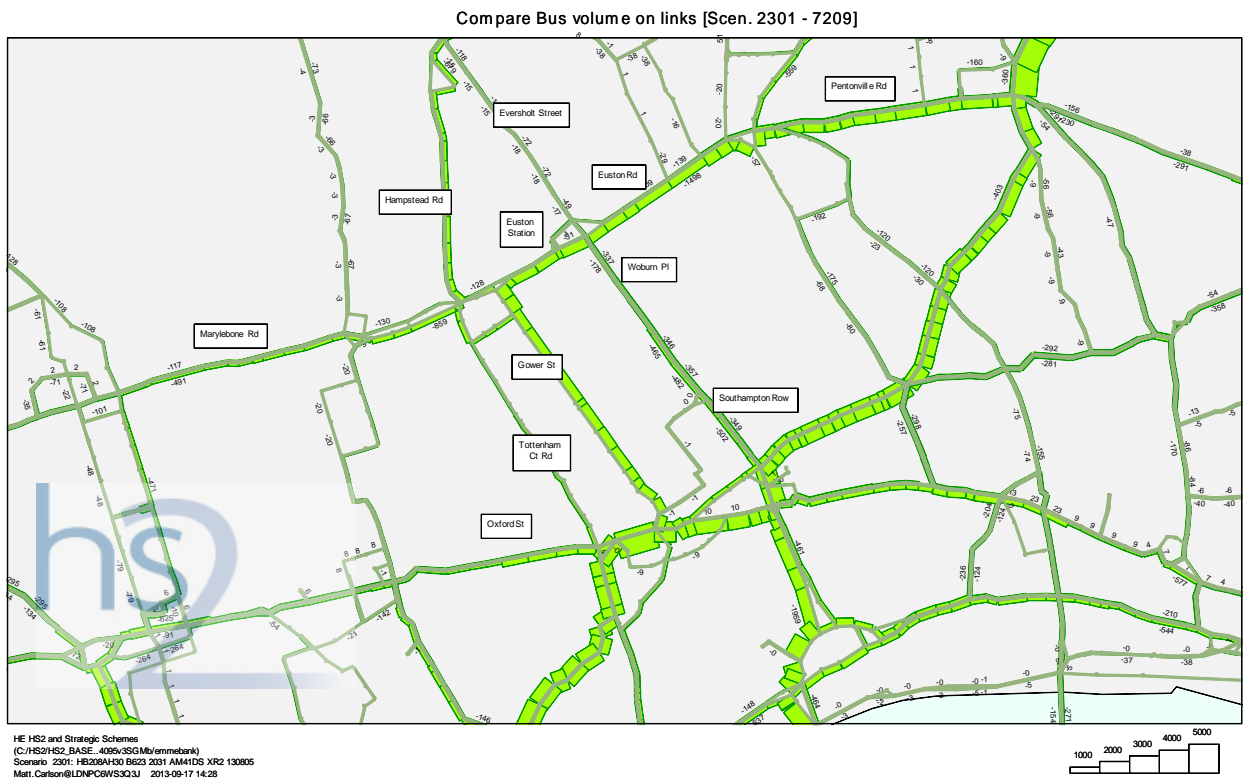


Figure 6-247: Bus flow differences 2041 AM peak Crossrail 2



Impacts at Old Oak Common

- 6.10.53 The overall impact of Crossrail 2 on station interchange at Old Oak Common is very small, with the scale of individual changes also being relatively minor. Subsequently, the impact on station access and egress is marginal.
- 6.10.54 The impact on local buses is small; the only notable change being a reduction in load factors on Route 72 within the region of 5-10 percentage points. At its most southerly point at Norley Vale, this route is close to the Crossrail 2 changes so loses some passengers to the new rail services.

Impact on crowding

- 6.10.55 The crowding impacts of Crossrail 2 are shown in Figures 17 and 18 for the LU and NR networks respectively and in Figures 19 to 23 for individual lines. Crossrail 2 has substantial crowding benefits particularly on the LU network. The largest crowding reductions are forecast on:
- southbound Piccadilly Line from Finsbury Park to Holborn (>4PPSM to 3-4 PPSM);
 - southbound Victoria Line from Finsbury Park to Euston (>4PPSM to 3-4 PPSM);
 - Northern Line Bank branch between Bank and Moorgate in both directions. (>4PPSM to 3-4 PPSM);
 - northbound Victoria Line between Victoria and Oxford Circus Euston (>4PPSM to 3-4 PPSM);
 - northbound Northern Line from Tooting Broadway to Kennington (various reductions to the next lowest band of crowding); and
 - northbound Northern Line Charing Cross branch from Waterloo to Oxford Circus (various reductions to the next lowest band of crowding).
- 6.10.56 On the NR network, there are substantial reductions in crowding on services into Waterloo with reductions of 1-2 PPSM on the northbound WLL and on southbound services towards Finsbury Park. Crossrail 1 shows an increase in crowding between Tottenham Court Road and Farringdon. Crossrail 2 is itself very crowded with PPSM in excess of 4 northbound through the central area.

Figure 6-248: NR crowding 2041 AM peak Crossrail 2

National Rail and Tramlink Crowding
Crowded_HB208AH30: Scenario 2351

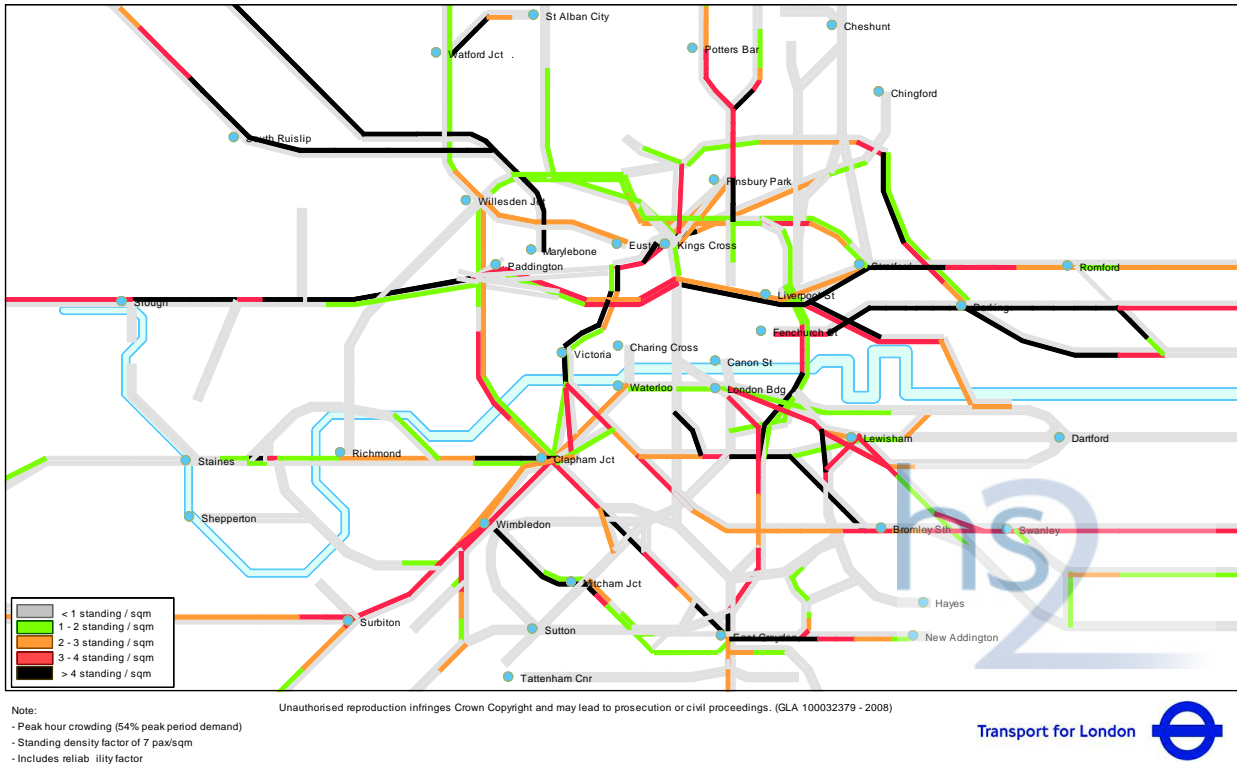


Figure 6-249: LU crowding 2041 AM peak Crossrail 2

LUL and DLR Crowding
Crowded_HB208AH30: Scenario 2351

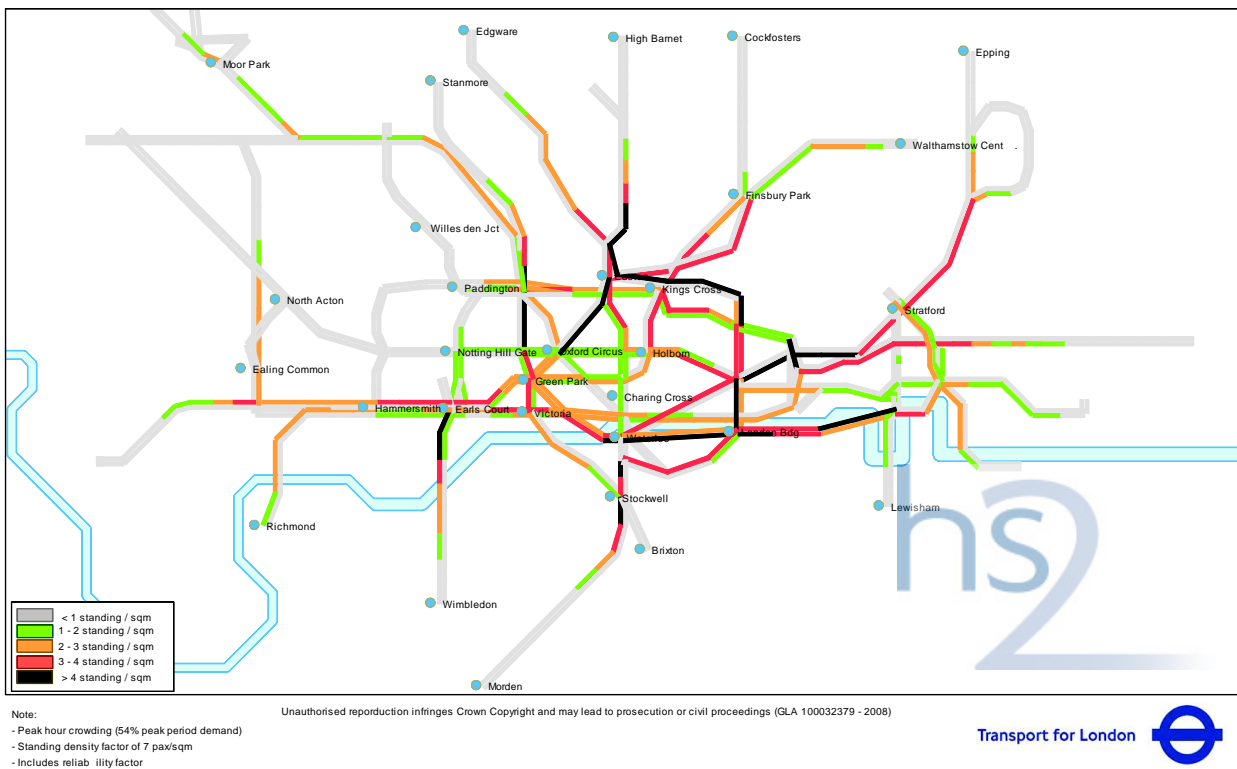


Figure 6-250: Line crowding AM 2041

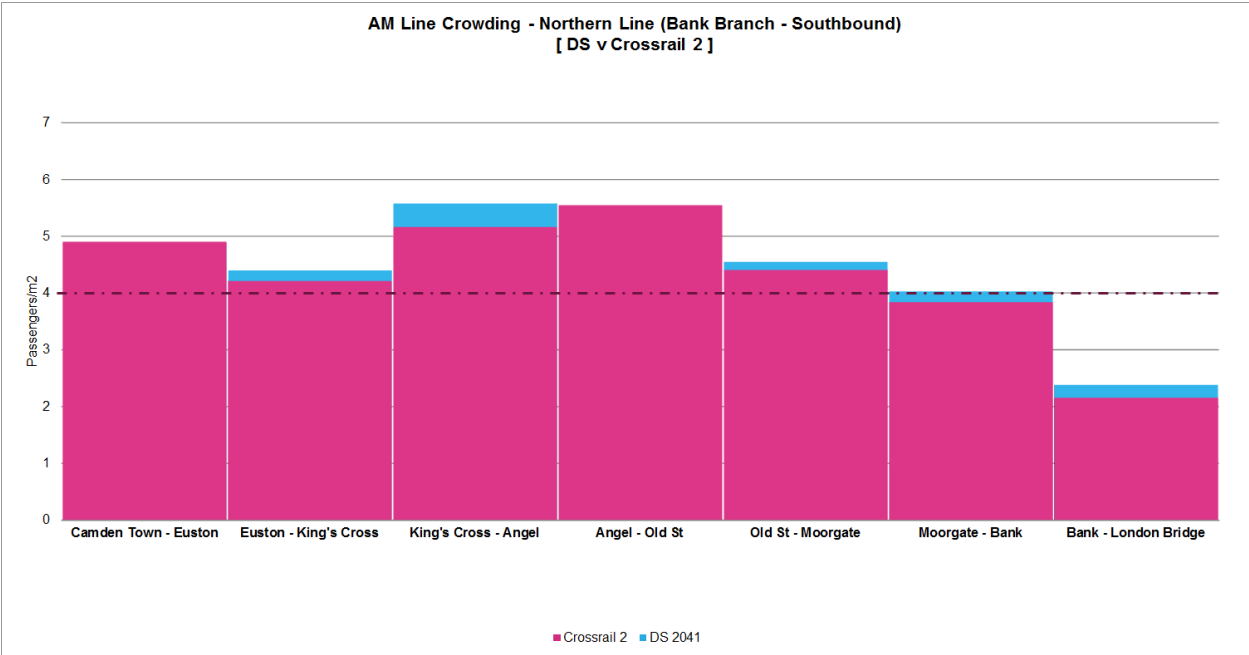


Figure 6-251: Line crowding AM 2041

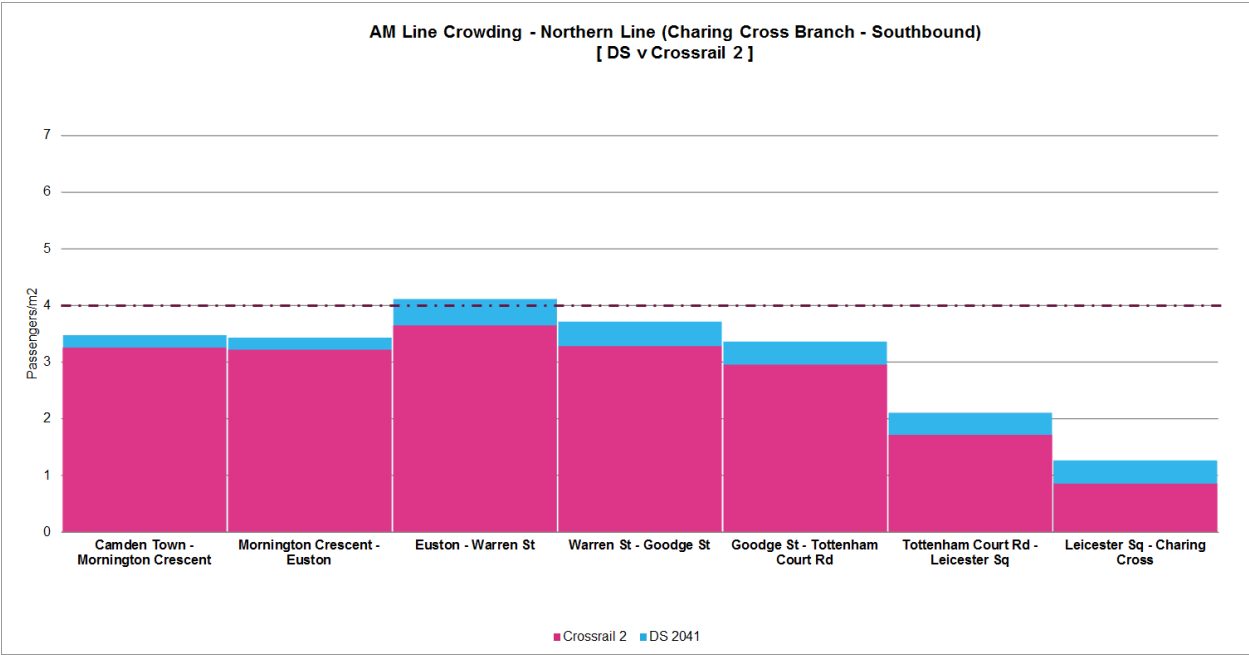


Figure 6-252: Line crowding AM 2041

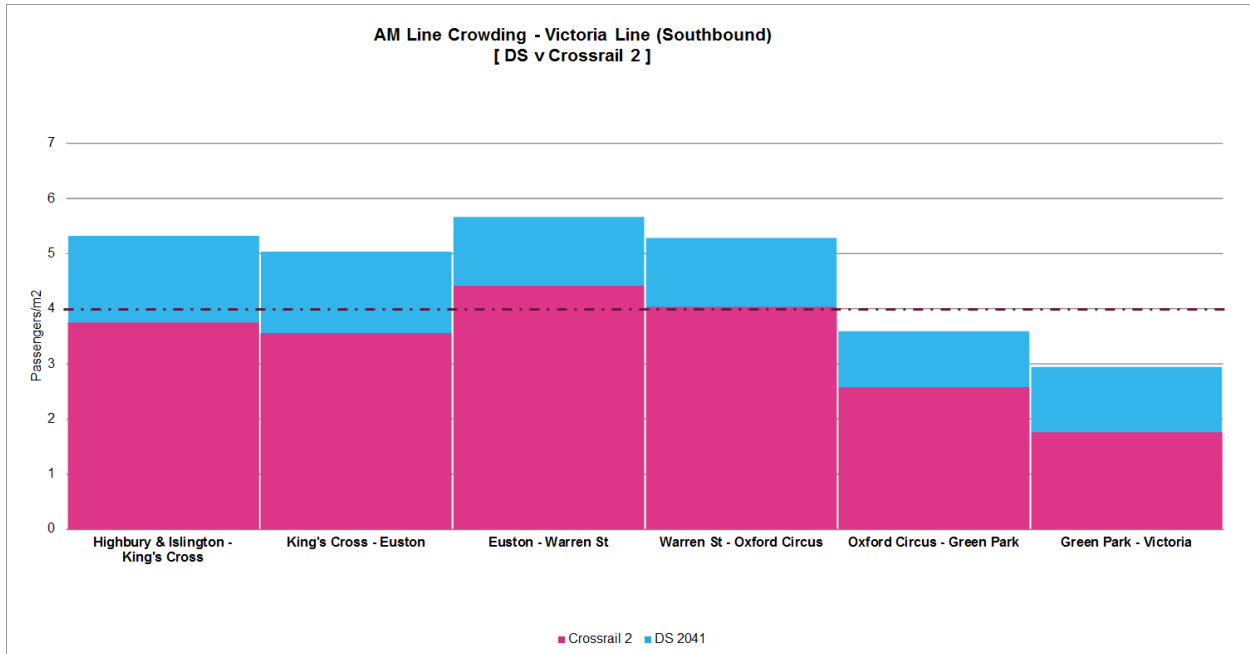


Figure 6-253: Line crowding AM 2041

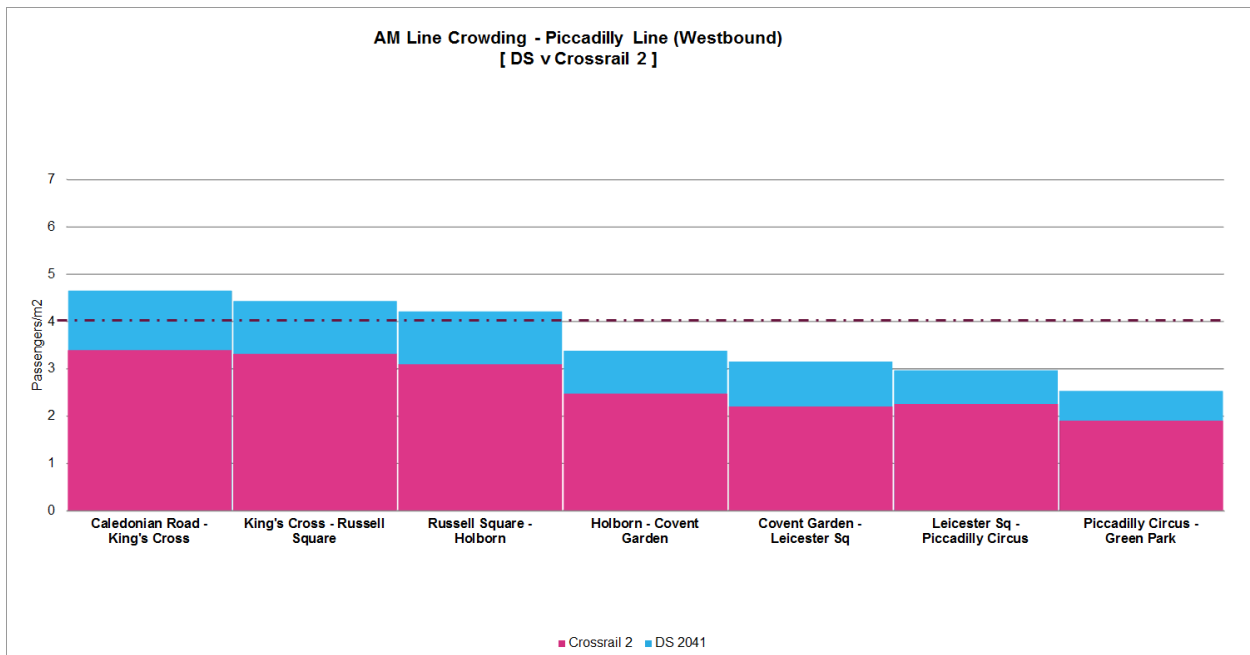
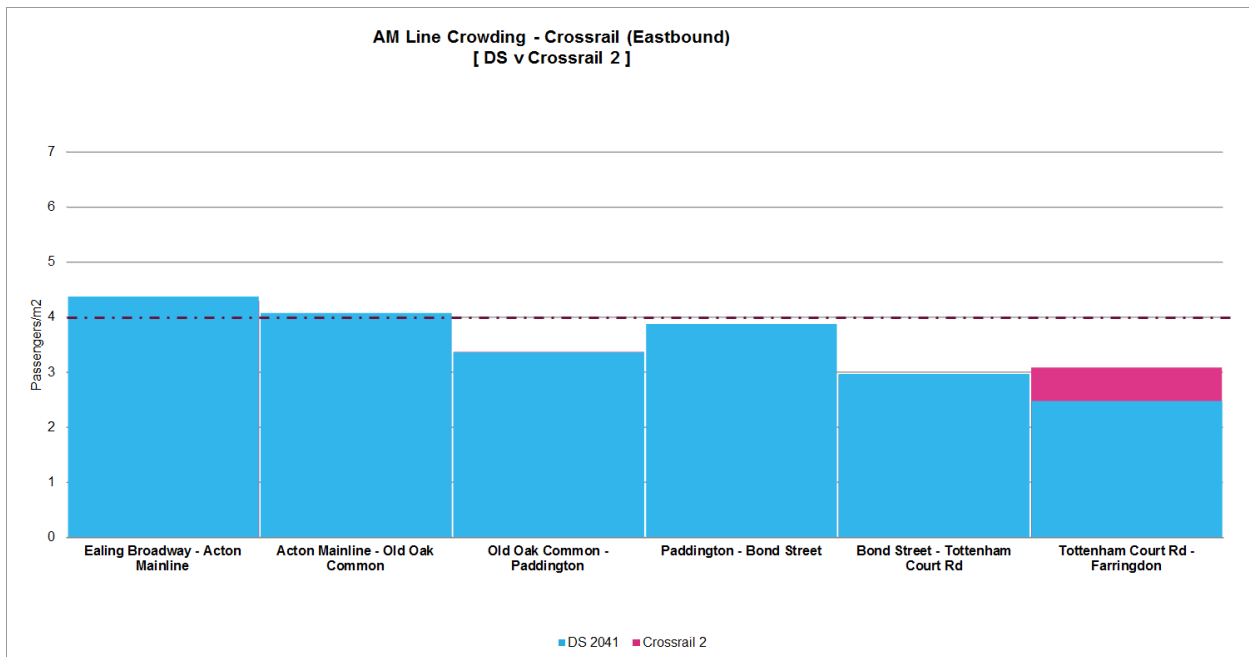


Figure 6-254: Line crowding AM 2041



Journey time impacts to HS2 passengers

- 6.10.57 Between 07:00 and 10:00, HS2 passengers are forecast to save a total of over 2,200 weighted hours as a result of Crossrail 2, mainly due to reductions in crowding on LU lines in central London, as well as improved access to areas served by Crossrail 2.

Summary

- 6.10.58 The inclusion of Crossrail 2 would lead to a substantial reduction in LU crowding on the Victoria and Northern Lines. There would, however, be around 10% more passengers using Euston station as a result of Crossrail 2, but it is likely that this could be accommodated by an enlarged station, as identified in the Crossrail 2 proposals at Euston. While the reduction in LU crowding at Euston would be of benefit to HS2 passengers, the primary benefits are for the wider travelling public that would use Crossrail 2 or benefit from its wider impact in reducing congestion.

GWML sensitivities

Scheme details

- 6.10.59 In this scenario, the services to and from Paddington set out below were removed and compensated for by increasing the frequency of the service from Henley to Twyford from every 45 minutes to every 30 minutes with no increase necessary on the Marlow/Bourne End branch (30 minute service in future baseline).
- two tph Paddington to Reading;
 - two tph Reading to Paddington;
 - one train Marlow to Paddington;
 - one train Henley-on-Thames to Paddington;
 - two tph Reading to Slough; and
 - two tph Slough to Paddington.
- 6.10.60 Four of the six Crossrail services per hour to/from Maidenhead were extended to/start back from Reading (calling at Twyford), leading to the following service pattern:
- 12 tph to / from Old Oak Common ;
 - four tph to / from Heathrow T4;
 - two tph to / from West Drayton;
 - two tph to / from Maidenhead; and
 - four tph to/from Reading.

Comparison with 2041 AM Proposed Scheme

Station demand

- 6.10.61 Table 6-348 shows that the GWML changes have a negligible impact on the balance of HS2 flows between Euston and Old Oak Common with largely unchanged rail and LU boarders and alighters at Euston. At Old Oak Common there are substantial reductions in both boarders and alighters on NR slow services both eastbound and westbound due to the replacement of GWML services with Crossrail services.

Table 6-348: 2041 AM Euston station demand, 07:00-10:00

Description	Future baseline plus operation 2041 AM			GWML sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (down)	4,074	-	4,074	4,080	-	4,080
Euston suburban (up)	-	24,608	24,608	-	24,637	24,637
Euston inter-city (down)	2,335	-	2,335	2,335	-	2,335
Euston inter-city/other (up)	-	7,126	7,126	-	7,118	7,118

Description	Future baseline plus operation 2041			GWML sensitivity test 2041 AM		
	AM					
Euston HS2 (up)	-	24,666	24,666	-	24,634	24,634
Euston HS2 (down)	18,269	-	18,269	18,414	-	18,414
Sub-total: Euston NR	24,678	56,400	81,078	24,829	56,389	81,218
Euston LU						
Euston Northern (Charing Cross northbound)	2,333	4,239	6,572	2,327	4,355	6,682
Euston Northern (Charing Cross southbound)	9,092	2,550	11,642	9,099	2,552	11,651
Euston Northern (Bank northbound)	4,174	3,819	7,993	4,168	3,825	7,993
Euston Northern (Bank southbound)	9,237	8,241	17,478	9,239	8,243	17,482
Euston Victoria (northbound)	3,616	9,924	13,540	3,622	9,898	13,520
Euston Victoria (southbound)	12,892	5,338	18,230	12,895	5,330	18,225
Sub-total: Euston LU	41,344	34,111	75,455	41,350	34,203	75,553
Euston Square LU						
Euston Square Met (northbound/westbound)	3,590	8,878	12,468	3,662	8,934	12,596
Euston Square Met (southbound/eastbound)	11,850	8,301	20,151	11,818	8,257	20,075
Sub-total: Euston Square LU	15,440	17,179	32,619	15,480	17,191	32,671
Old Oak Common						
Old Oak Common NR slow down	4,022	10,179	14,201	3,010	8,978	11,988
Old Oak Common NR slow up	25,271	7,907	33,178	22,272	4,556	26,828
Old Oak Common NR fast down	7,284	0	7,284	7,117	0	7,117
Old Oak Common NR fast up	-	17,371	17,371	-	17,472	17,472
Old Oak Common HS2 up	-	9,477	9,477	-	9,509	9,509
Old Oak Common HS2 down	7,956	-	7,956	7,810	-	7,810
Sub-total: Old Oak Common	44,533	44,934	89,467	40,209	40,515	80,724

Demand at other stations

- 6.10.62 Table 6-349 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.
- 6.10.63 There are very limited impacts, with the largest, but still relatively small, reductions at Paddington and Ealing Broadway, which are both a direct result of replacing GWML services with Crossrail services.

Table 6-349: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	Future baseline plus operation 2041 AM	GWML sensitivity test 2041 AM	Absolute difference	% difference
Oxford Circus	86,079	86,245	166	0%
Marylebone	23,414	23,558	144	1%
Green Park	56,147	56,253	106	0%
Moorgate	35,533	35,635	102	0%
Euston (inc. Euston Square)	114,718	114,818	100	0%
Farringdon	70,401	70,501	100	0%
Paddington	60,043	58,758	-1,285	-2%
Sub-total	446,335	445,768	-567	0%
Total (all Zone 1)	2,088,562	2,088,608	46	0%
Camden Town	18,390	18,398	8	0%
Mornington Crescent	2,922	2,924	2	0%
Ealing Broadway	29,884	29,439	-445	-1%

Impact on flows

- 6.10.64 Table 6-350 and Figure 6-255 to Figure 6-257 show the passenger flow impact of the GWML sensitivity test compared with the future baseline plus operation. The LU network shows small increases (+500) on the Central Line from Ealing Broadway, gradually decreasing in volume eastwards, with similar changes on the westbound Piccadilly Line.
- 6.10.65 On NR, there are flow reductions on GWML towards Old Oak Common of 1,800 and eastbound reductions on Crossrail from Paddington of some 400. There are no discernible impacts on bus flows as a result of the sensitivity test.

Table 6-350: 2041 network impacts, AM peak period

Services		Future baseline plus operation 2041 AM	GWML sensitivity test 2041 AM	% difference
Euston Classic suburban	Inbound	24,608	24,637	0%
	Outbound	4,074	4,080	0%
Euston Classic inter-city	Inbound	7,126	7,118	0%
	Outbound	2,335	2,335	0%
HS2 at Euston	Inbound	24,666	24,634	0%
	Outbound	18,269	18,414	1%
HS2 at Old Oak Common	Inbound	34,143	34,143	0%
	Outbound	26,224	26,224	0%

Services		Future baseline plus operation 2041 AM	GWML sensitivity test 2041 AM	% difference
Sub-total at Euston	Inbound	56,400	56,389	0%
	Outbound	24,678	24,829	1%
Victoria Line, north of Euston	Northbound	26,527	26,574	0%
	Southbound	66,699	66,719	0%
Victoria Line, south of Euston	Northbound	32,834	32,850	0%
	Southbound	74,254	74,284	0%
Northern Line (Bank branch), north of Euston	Northbound	21,444	21,449	0%
	Southbound	39,027	39,036	0%
Northern Line (Bank branch), south of Euston	Northbound	21,088	21,105	0%
	Southbound	40,022	40,032	0%
Northern Line (Charing Cross branch), north of Euston	Northbound	12,629	12,620	0%
	Southbound	35,810	35,828	0%
Northern Line (Charing Cross branch), south of Euston	Northbound	14,535	14,648	1%
	Southbound	42,352	42,375	0%
Metropolitan/Hammersmith & City, Circle Line (west of Euston Square)	Eastbound	35,855	35,859	0%
	Westbound	33,379	33,465	0%
Metropolitan/Hammersmith & City, Circle Line (east of Euston Square)	Eastbound	39,404	39,421	0%
	Westbound	38,667	38,737	0%
GWML slow/Crossrail (Acton Main Line to Old Oak Common)	Eastbound	31,491	29,553	-6%
	Westbound	14,042	14,098	0%
Crossrail Old Oak Common to Paddington	Eastbound	47,386	47,268	0%
	Westbound	20,200	20,066	-1%
Crossrail Paddington to Bond Street	Eastbound	52,175	51,769	-1%
	Westbound	25,415	25,291	0%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,722	43,356	-1%
	Southbound	43,822	43,523	-1%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,165	1,175	1%
	Southbound	1,596	1,599	0%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	3,013	3,018	0%
	Westbound	3,995	3,991	0%
GWML fast (Old Oak Common to	Eastbound	18,113	18,114	0%

Services		Future baseline plus operation 2041 AM	GWML sensitivity test 2041 AM	% difference
Paddington IC)	Westbound	7,783	7,787	0%
GWML slow (Old Oak Common to Paddington ML)	Eastbound	1,469	0	-100%
	Westbound	0	0	0%

Figure 6-255: LU flow differences 2041 AM peak GWML sensitivities

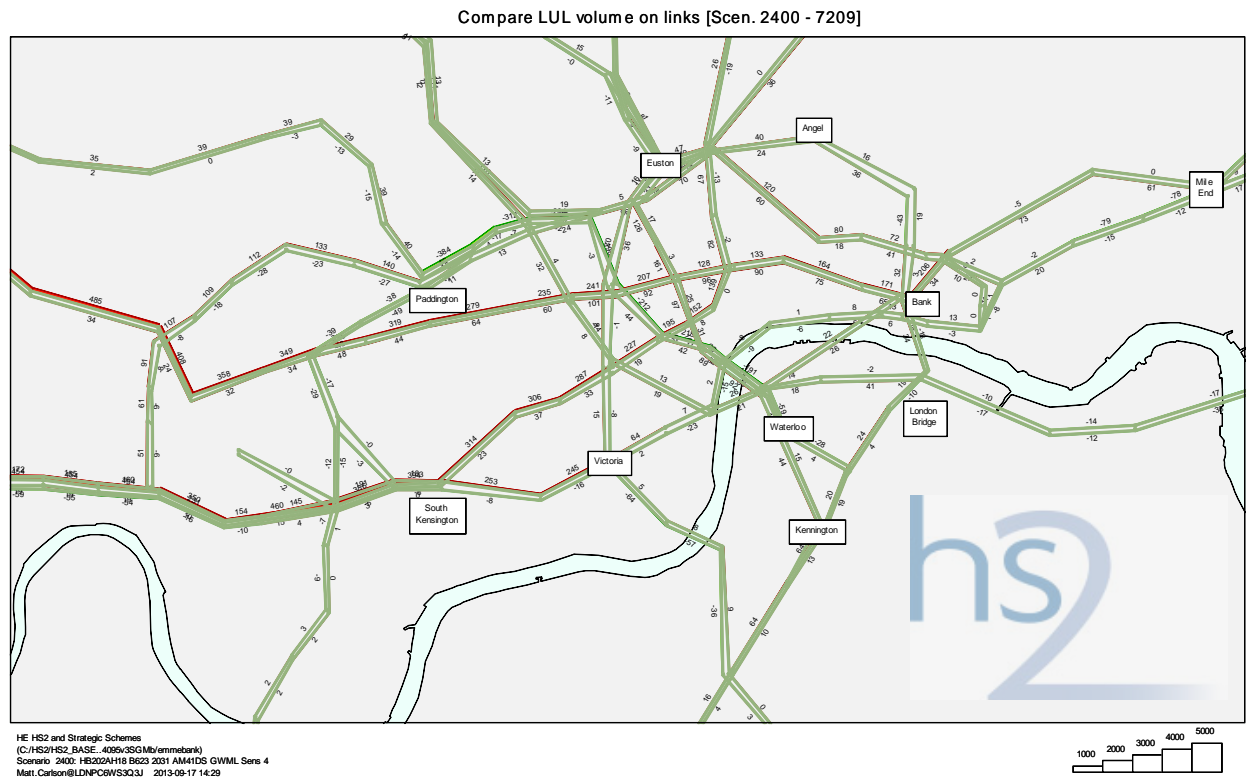


Figure 6-256: NR flow differences 2041 AM peak GWML sensitivities

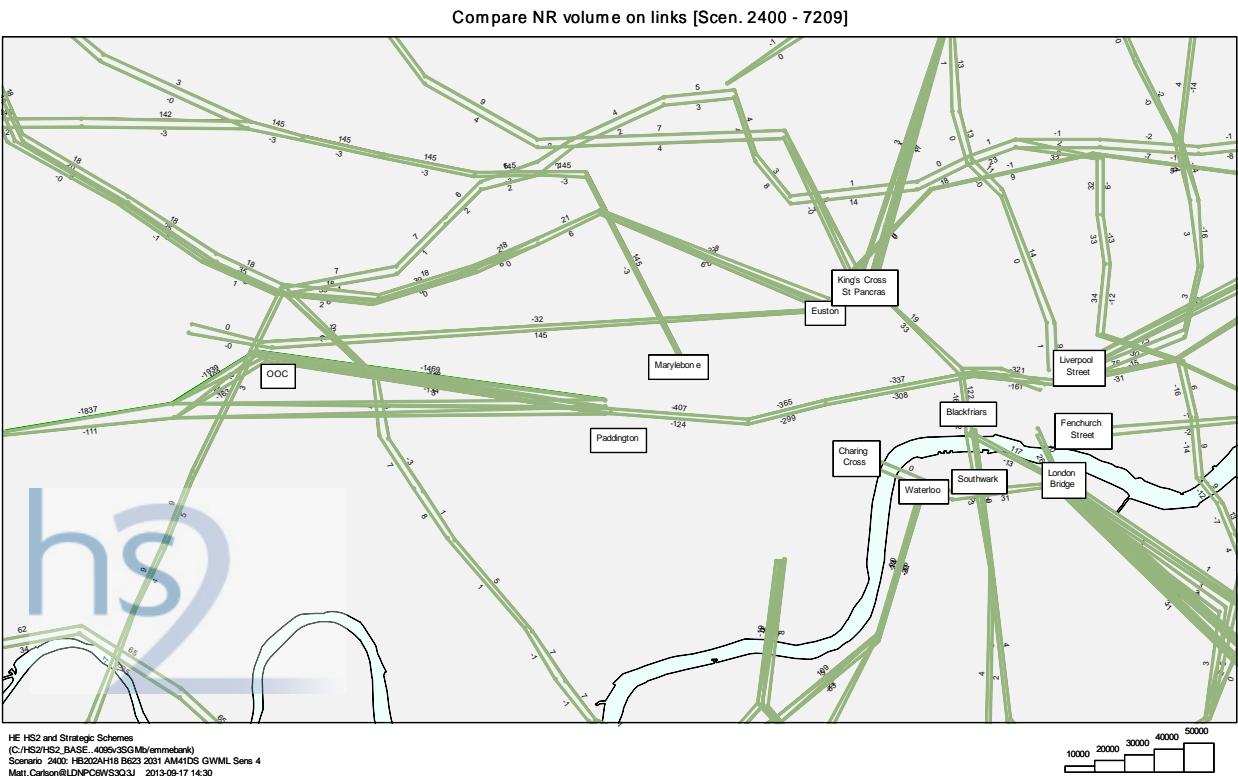
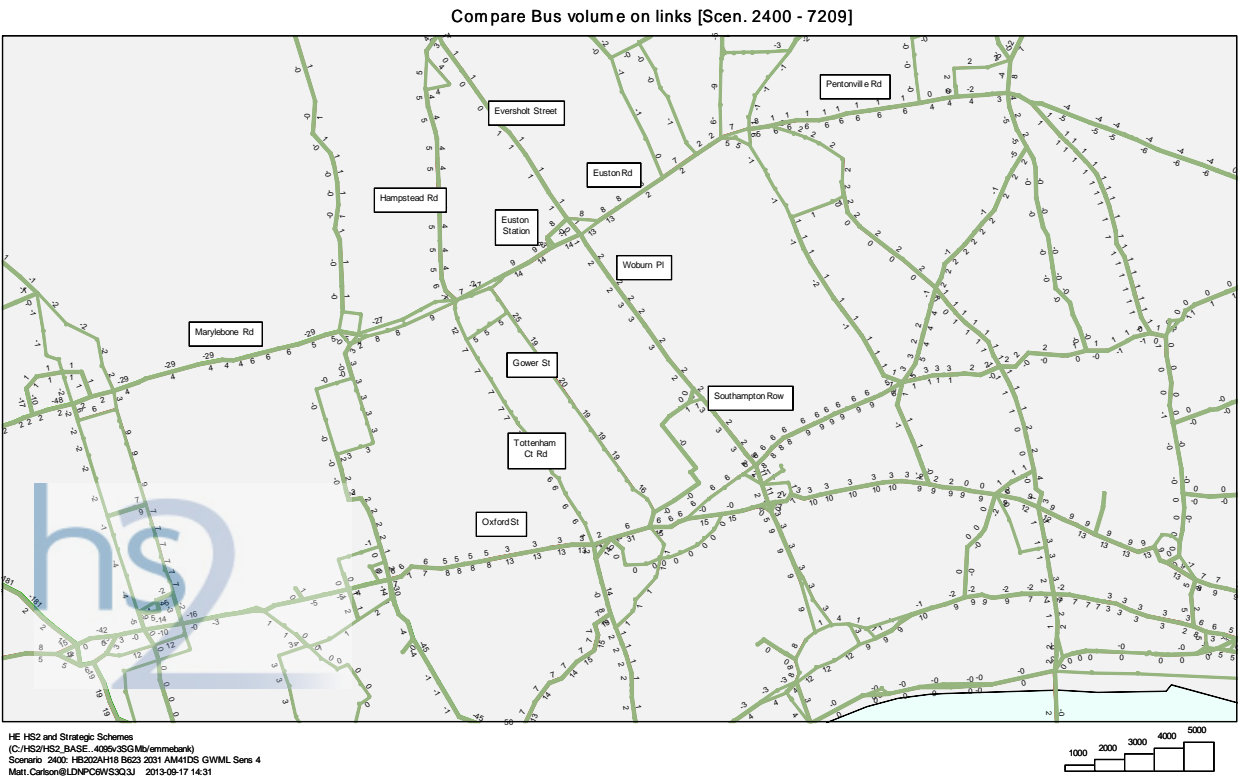


Figure 6-257: Bus flow differences 2041 AM peak GWML sensitivities



Impacts at Old Oak Common

- 6.10.66 The impact of the GWML sensitivity test on Old Oak Common station interchange is generally as expected. The largest impact is on interchange movements changing service but using the same slow eastbound platform. It has been recognised in analysis of the future baseline case that the majority of these movements are from the "residual" trains onto Crossrail services; hence the reduction here is anticipated. However, it is worth noting that there still remain approximately 1,500 of these interchange trips on the slow eastbound platform, indicating that there is a substantial amount of switching between different Crossrail services.
- 6.10.67 As a result of the removal of the majority of these movements, the proportion of 'same platform' interchange of total interchange is lower than the future baseline case at under 6%. The impact on front door flows is very small as expected.
- 6.10.68 There are no impacts on the load factors on local buses.

Impact on crowding

- 6.10.69 Crowding for NR and LU networks is shown in Figures 27 and 28. The GWML sensitivity test has no discernible impacts on wider crowding across either the LU or NR networks, with the exception of an increase in crowding on Crossrail of up to 0.5 PPSM between Ealing Broadway and Old Oak Common as shown in Figure 6-26o.
- 6.10.70 With the exception of Crossrail, no other line by line graphs are reproduced for this sensitivity test due to the limited crowding impacts.

Figure 6-258: NR crowding 2041 AM peak GWML sensitivities

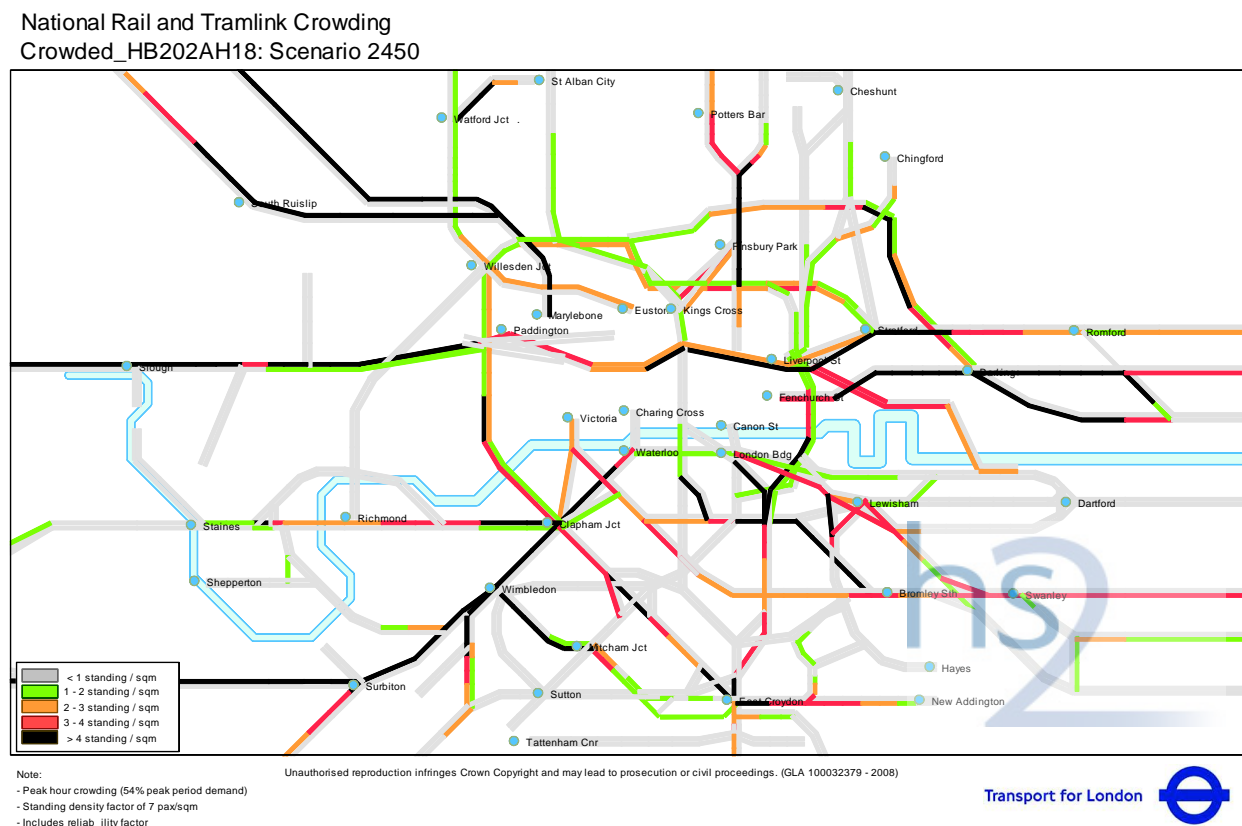


Figure 6-259: LU crowding 2041 AM Peak GWML sensitivities

LUL and DLR Crowding
Crowded_HB202AH18: Scenario 2450

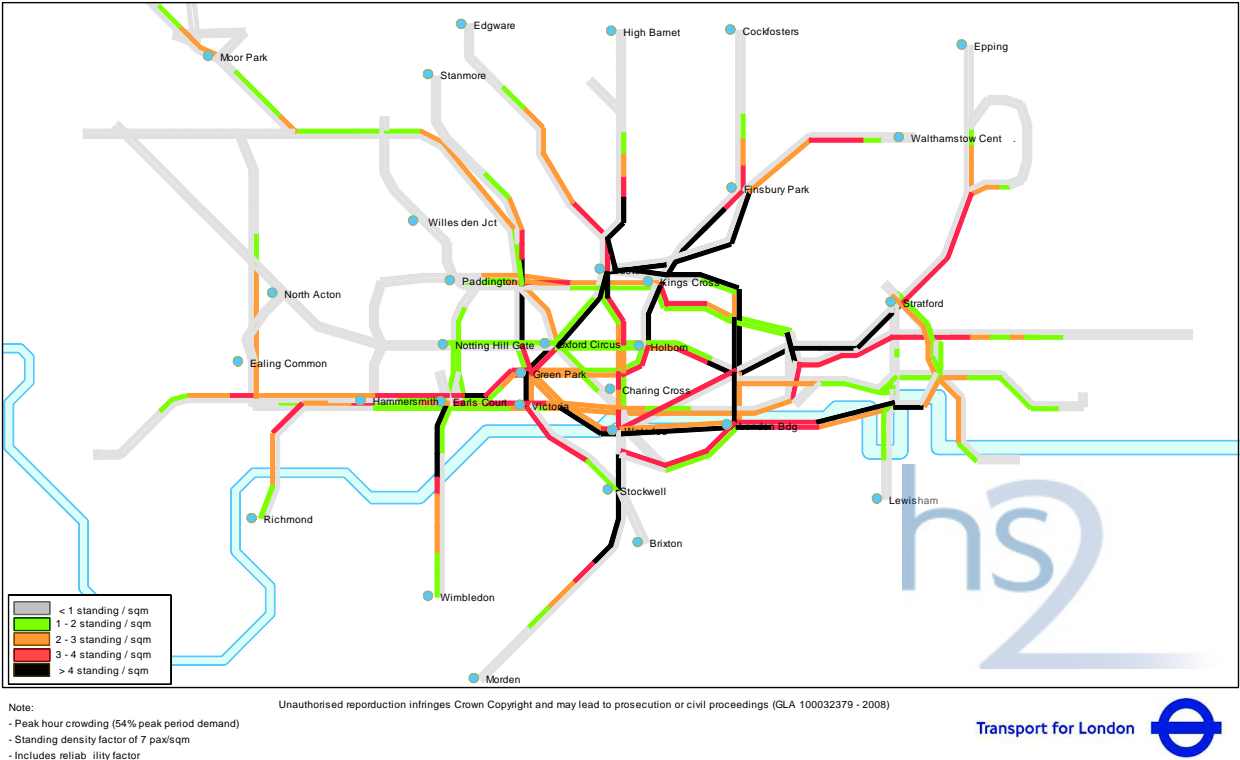
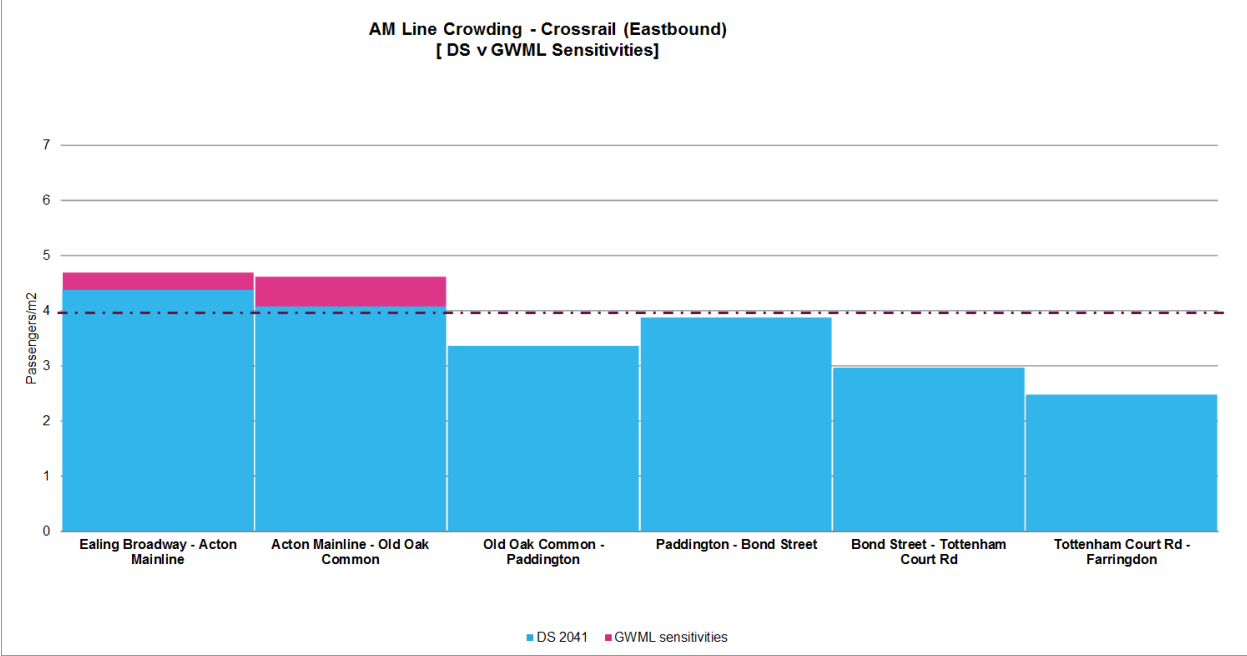


Figure 6-260: Line crowding AM 2041



Journey time impacts to HS2 passengers

6.10.71 HS2 passengers are not forecast to benefit from the GWML sensitivities, with fewer services on the GWML marginally increasing overall weighted journey times.

Summary

- 6.10.72 GWML changes will have the largest impact on interchange movements at Old Oak Common station, almost all of which will be limited to NR and Crossrail services. They will have negligible impacts on the balance of HS2 flows between Euston and Old Oak Common stations and only marginally increase overall HS2 weighted journey times.

Euston Area Plan

Scheme description

- 6.10.73 The Euston Area Plan (EAP) contains proposals for a number of development scenarios. For the purposes of this test, it was agreed that a 'mid-level' scenario of 3,700 homes and 7,750 jobs would be assumed. These were included in an LTS run with the resulting change in public transport matrix passed across into Railplan. There are no material changes to the supply networks.

Comparison with 2041 AM Proposed Scheme

Station demand

- 6.10.74 Table 6-351 shows the impacts of the EAP are largely limited to increased boarders and alighters at Euston and Euston Square, with each LU line having a small increase totalling a 2% and 4% overall increase in alighters respectively. These changes are due to increased population and employment opportunities within the Euston area.

Table 6-351: 2041 AM Euston station demand, 07:00-10:00

Description	Future baseline plus operation 2041 AM			EAP sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (down)	4,074	-	4,074	4,087	-	4,087
Euston suburban (up)	-	24,608	24,608	-	24,699	24,699
Euston inter-city (down)	2,335	-	2,335	2,335	-	2,335
Euston inter-city/other (up)	-	7,126	7,126	-	7,146	7,146
Euston HS2 (up)	-	24,666	24,666	-	24,662	24,662
Euston HS2 (down)	18,269	-	18,269	18,220	-	18,220
Sub-total: Euston NR	24,678	56,400	81,078	24,642	56,507	81,149
Euston LU						
Euston Northern (Charing Cross northbound)	2,333	4,239	6,572	2,352	4,482	6,834
Euston Northern (Charing Cross southbound)	9,092	2,550	11,642	9,151	2,629	11,780
Euston Northern (Bank northbound)	4,174	3,819	7,993	4,191	3,945	8,136
Euston Northern (Bank southbound)	9,237	8,241	17,478	9,240	8,329	17,569
Euston Victoria (northbound)	3,616	9,924	13,540	3,639	10,066	13,705
Euston Victoria (southbound)	12,892	5,338	18,230	12,909	5,498	18,407
Sub-total: Euston LU	41,344	34,111	75,455	41,482	34,949	76,431
Euston Square LU						
Euston Square Met (northbound/westbound)	3,590	8,878	12,468	3,701	9,346	13,047
Euston Square Met (southbound/eastbound)	11,850	8,301	20,151	12,037	8,597	20,634

Description	Future baseline plus operation 2041 AM			EAP sensitivity test 2041 AM		
Sub-total: Euston Square LU	15,440	17,179	32,619	15,738	17,943	33,681
Old Oak Common						
Old Oak Common NR slow down	4,022	10,179	14,201	3,997	10,185	14,182
Old Oak Common NR slow up	25,271	7,907	33,178	25,231	7,893	33,124
Old Oak Common NR fast down	7,284	0	7,284	7,295	0	7,295
Old Oak Common NR fast up	-	17,371	17,371	-	17,363	17,363
Old Oak Common HS2 up	-	9,477	9,477	-	9,481	9,481
Old Oak Common HS2 down	7,956	-	7,956	8,004	-	8,004
Sub-total: Old Oak Common	44,533	44,934	89,467	44,527	44,922	89,449

Demand at other stations

- 6.10.75 Table 6-352 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.
- 6.10.76 As expected, the only noticeable impact is an increase in access, egress and interchange at Euston/Euston Square as a result of the development related demand.

Table 6-352: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	Future baseline plus operation 2041 AM	EAP sensitivity test 2041 AM	Absolute difference	% difference
Euston (inc. Euston Square)	114,718	116,961	2,243	2%
Warren Street	16,929	17,377	448	3%
St Pancras	20,227	20,639	412	2%
Victoria	146,426	146,630	204	0%
Liverpool Street	123,449	123,634	185	0%
London Bridge	171,504	171,655	151	0%
Russell Square	8,235	8,337	102	1%
Oxford Circus	86,079	85,975	-104	0%
Farringdon	70,401	70,257	-144	0%
Baker Street	40,198	40,053	-145	0%
Sub-total	798,166	801,518	3,352	0%
Total (all Zone 1)	2,088,562	2,092,071	3,509	0%
Camden Town	18,390	18,410	20	0%
Mornington Crescent	2,922	3,039	117	4%

Station	Future baseline plus operation 2041 AM	EAP sensitivity test 2041 AM	Absolute difference	% difference
Ealing Broadway	29,884	29,887	3	0%

Impact on flows

6.10.77 Table 6-353 and Figure 6-261 to Figure 6-263 show the passenger flow impact of EAP and indicate virtually no change in line flows.

Table 6-353: 2041 network impacts, AM peak period

Services		Future baseline plus operation 2041 AM	EAP sensitivity test 2041 AM	% difference
Euston Classic suburban	Inbound	24,608	24,699	0%
	Outbound	4,074	4,087	0%
Euston Classic inter-city	Inbound	7,126	7,146	0%
	Outbound	2,335	2,335	0%
HS2 at Euston	Inbound	24,666	24,662	0%
	Outbound	18,269	18,220	0%
HS2 at Old Oak Common	Inbound	34,143	34,143	0%
	Outbound	26,224	26,224	0%
Sub-total at Euston	Inbound	56,400	56,507	0%
	Outbound	24,678	24,642	0%
Victoria Line, north of Euston	Northbound	26,527	26,507	0%
	Southbound	66,699	66,791	0%
Victoria Line, south of Euston	Northbound	32,834	32,935	0%
	Southbound	74,254	74,202	0%
Northern Line (Bank branch), north of Euston	Northbound	21,444	21,458	0%
	Southbound	39,027	39,080	0%
Northern Line (Bank branch), south of Euston	Northbound	21,088	21,212	1%
	Southbound	40,022	39,991	0%
Northern Line (Charing Cross branch), north of Euston	Northbound	12,629	12,706	1%
	Southbound	35,810	35,831	0%
Northern Line (Charing Cross branch), south of Euston	Northbound	14,535	14,836	2%
	Southbound	42,352	42,353	0%
Metropolitan/Hammersmith & City, Circle Line (west of Euston Square)	Eastbound	35,855	36,077	1%
	Westbound	33,379	33,325	0%
Metropolitan/Hammersmith & City,	Eastbound	39,404	39,517	0%

Services		Future baseline plus operation 2041 AM	EAP sensitivity test 2041 AM	% difference
Circle Line (east of Euston Square)	Westbound	38,667	38,970	1%
GWML slow/Crossrail (Acton Main Line to Old Oak Common)	Eastbound	31,491	31,536	0%
	Westbound	14,042	14,025	0%
Crossrail Old Oak Common to Paddington	Eastbound	47,386	47,391	0%
	Westbound	20,200	20,214	0%
Crossrail Paddington to Bond Street	Eastbound	52,175	52,203	0%
	Westbound	25,415	25,424	0%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,722	43,769	0%
	Southbound	43,822	43,830	0%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,165	1,167	0%
	Southbound	1,596	1,594	0%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	3,013	3,017	0%
	Westbound	3,995	3,995	0%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	18,113	18,141	0%
	Westbound	7,783	7,770	0%
GWML slow (Old Oak Common to Paddington ML)	Eastbound	1,469	1,484	1%
	Westbound	0	0	0%

Figure 6-261: LU flow differences 2041 AM peak EAP

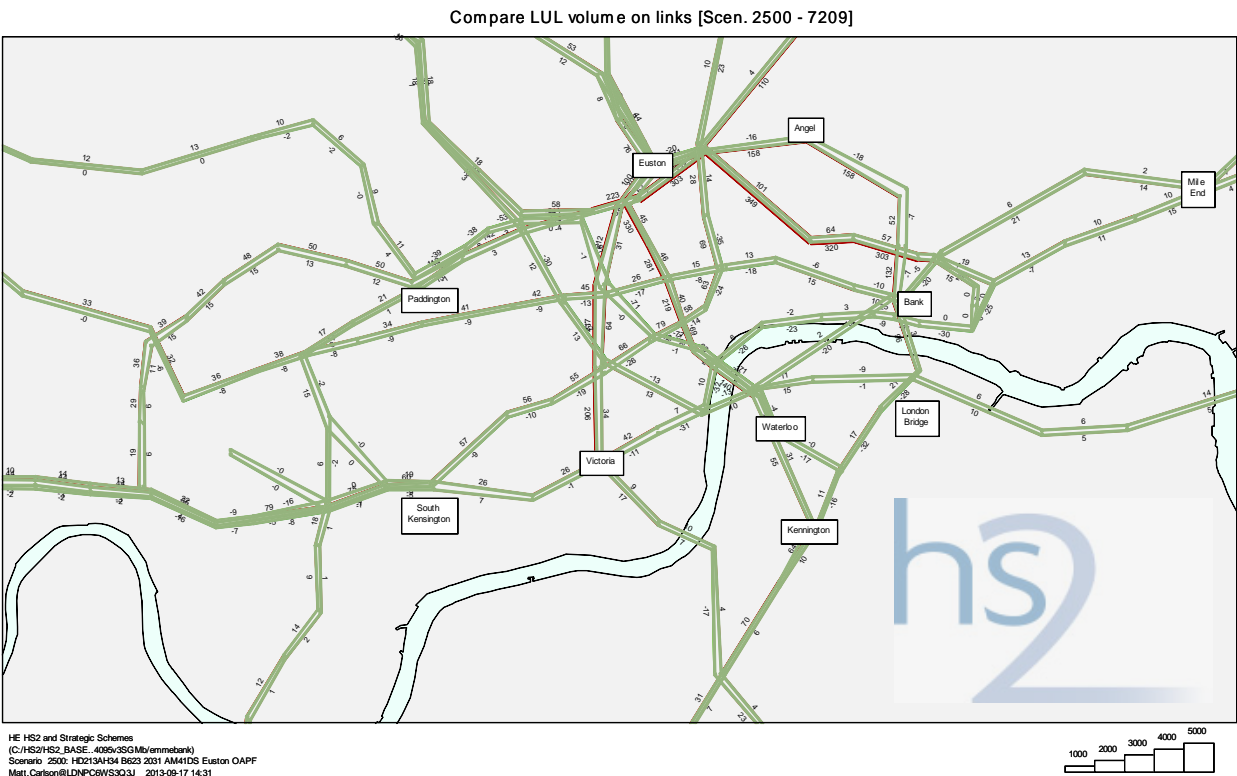


Figure 6-262: NR flow differences 2041 AM peak EAP

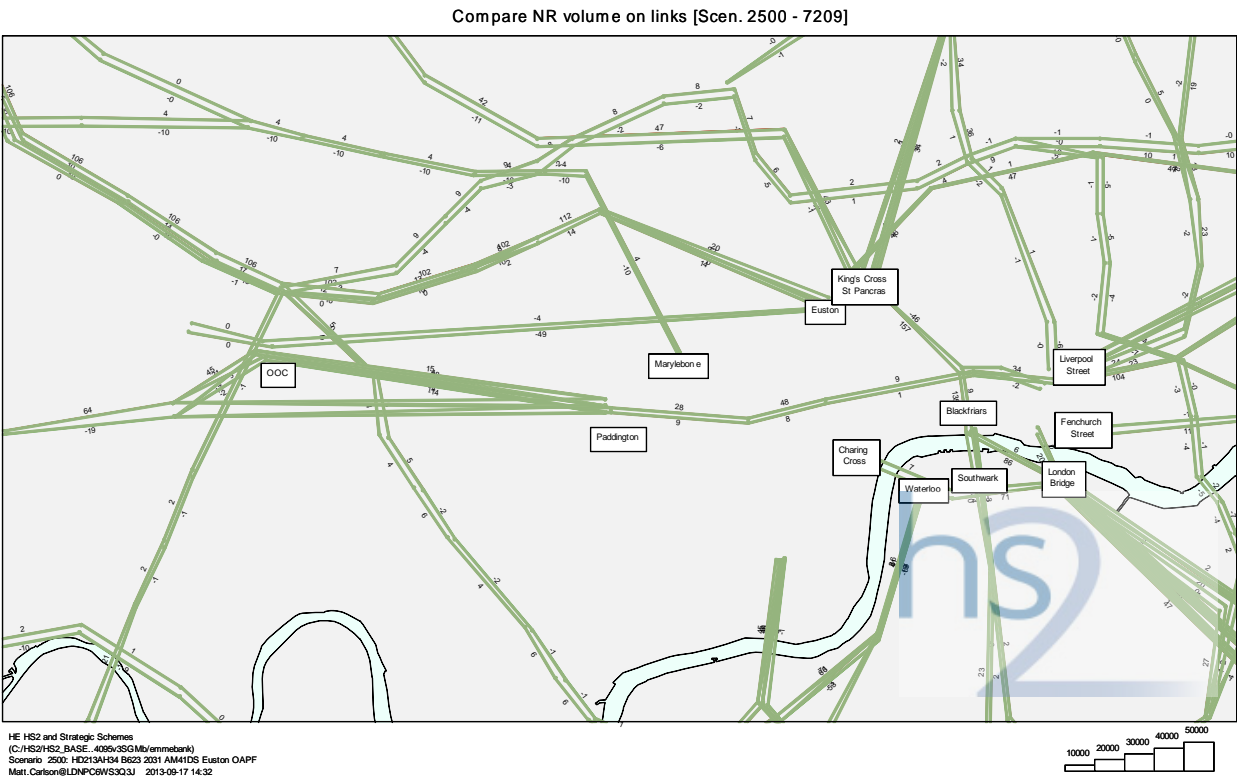
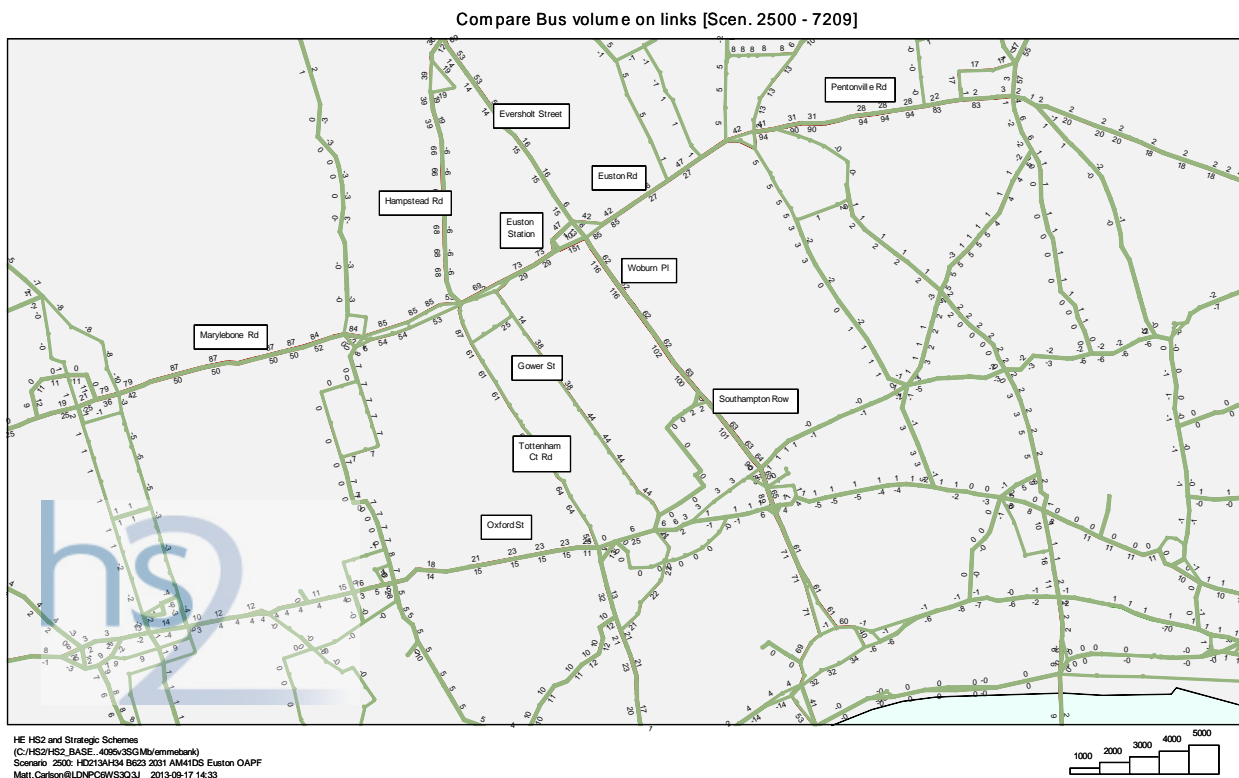


Figure 6-263: Bus flow differences 2041 AM peak EAP



Impacts at Old Oak Common

- 6.10.78 Due to the very localised impacts of the EAP around Euston, this sensitivity test has no discernible impacts at Old Oak Common.

Impact on crowding

- 6.10.79 Crowding for NR and LU networks is shown in Figure 6-264 and Figure 6-265. No line by line graphs are reproduced for this sensitivity test due to the very limited crowding impacts.

Figure 6-264: NR crowding 2041 AM peak EAP

National Rail and Tramlink Crowding
Crowded_HD213AH34: Scenario 2550

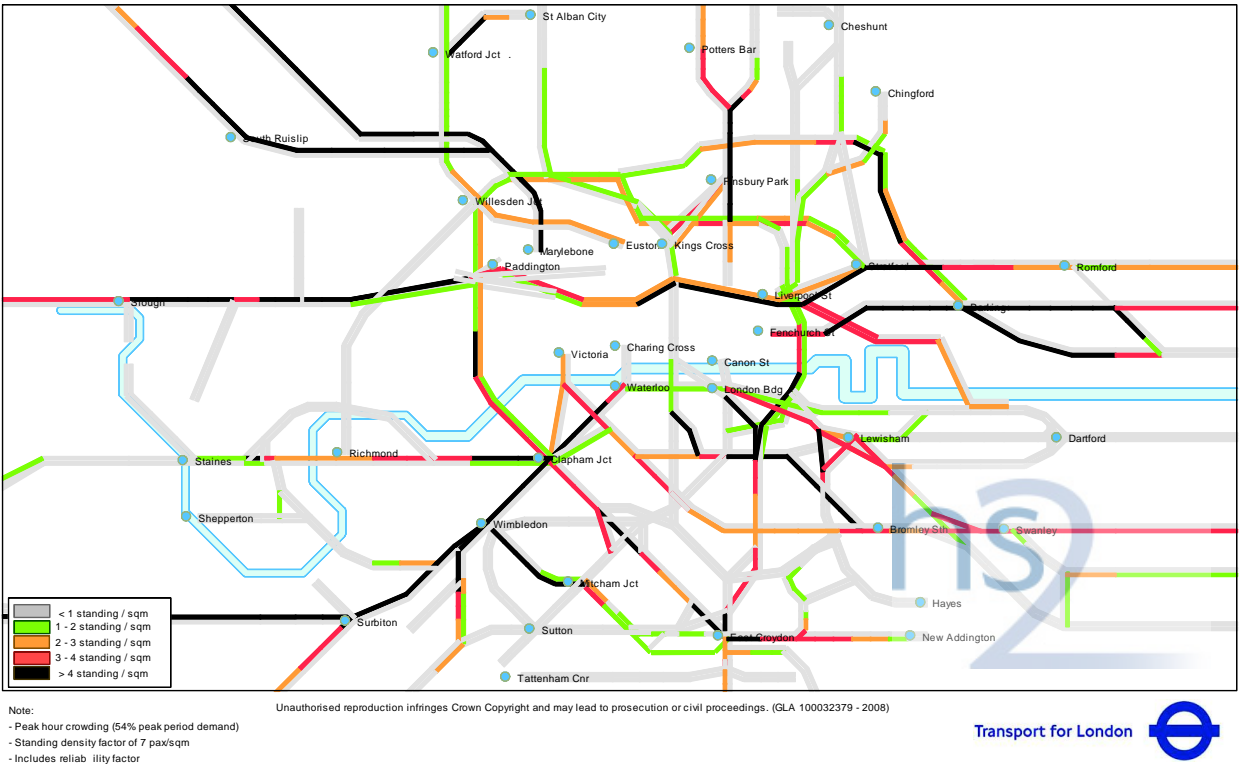
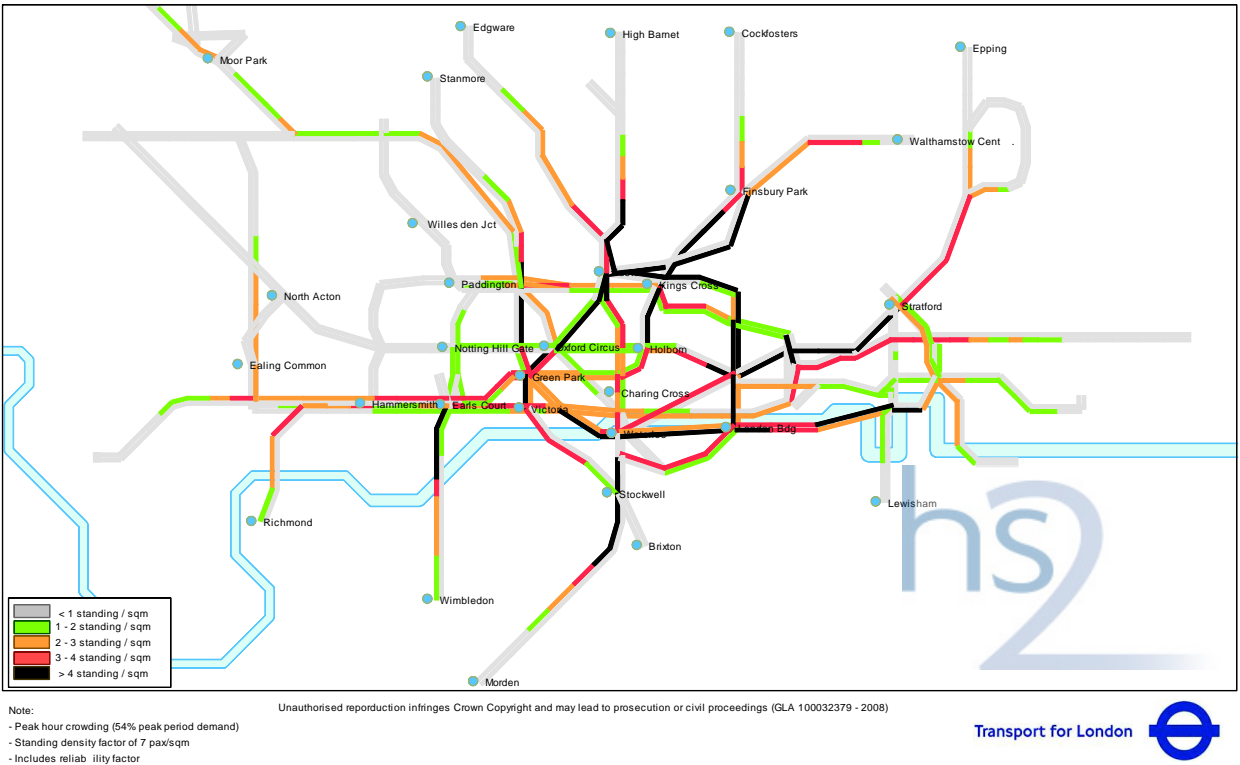


Figure 6-265: LU crowding 2041 AM peak EAP

LUL and DLR Crowding
Crowded_HD213AH34: Scenario 2550



Journey time impacts to HS2 passengers

- 6.10.80 HS2 passengers are not forecast to benefit from the Euston Area Plan, with minimal changes to onward weighted journey times.

Summary

- 6.10.81 The Euston Area Plan proposals would add further demand to the areas in the immediate hinterland of Euston station. However, changes in passenger flows and crowding on LU services are expected to be very small.

Old Oak Common OAPF without Overground

Scheme description

- 6.10.82 The Old Oak Common Opportunity Area Planning Framework (OAPF) draft proposals contains proposals for a number of development scenarios. For the purposes of this test, it was agreed that a 'mid-level' scenario of 24,000 homes and 55,000 jobs would be assumed but with 50% (27,500) of these jobs assumed to be abstracted from the rest of the GLA area. These were included in an LTS run with the resulting change in public transport demand passed across into Railplan. There were no material changes to the supply networks. In addition to the new Old Oak Common station (HS2, GWML and Crossrail), the OAPF area will also be accessible via Willesden Junction (NLL and WLL), East Acton (Central Line) and Harlesden (WLL). For the northern part of the OAPF area Willesden junction will be the closest access station.

Comparison with 2041 AM Proposed Scheme

Station demand

- 6.10.83 Table 6-354 shows an unchanged balance of HS2 flows between Euston and Old Oak Common. The key impact is at Old Oak Common with an additional 2,590 passengers alighting from westbound NR slow services and 775 additional passengers alighting from eastbound NR slow services due to the increased employment opportunities in the area.

Table 6-354: 2041 AM Euston station demand, 07:00-10:00

Description	Future baseline plus operation 2041 AM			Old Oak Common OAPF without Overground sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (down)	4,074	-	4,074	4,103	-	4,103
Euston suburban (up)	-	24,608	24,608	-	24,617	24,617
Euston inter-city (down)	2,335	-	2,335	2,338	-	2,338
Euston inter-city/other (up)	-	7,126	7,126	-	7,095	7,095
Euston HS2 (up)	-	24,666	24,666	-	24,726	24,726
Euston HS2 (down)	18,269	-	18,269	18,494	-	18,494
Sub-total: Euston NR	24,678	56,400	81,078	24,935	56,438	81,373
Euston LU						
Euston Northern (Charing Cross northbound)	2,333	4,239	6,572	2,314	4,292	6,606
Euston Northern (Charing Cross southbound)	9,092	2,550	11,642	9,117	2,551	11,668
Euston Northern (Bank northbound)	4,174	3,819	7,993	4,164	3,850	8,014
Euston Northern (Bank southbound)	9,237	8,241	17,478	9,222	8,272	17,494
Euston Victoria (northbound)	3,616	9,924	13,540	3,613	9,980	13,593
Euston Victoria (southbound)	12,892	5,338	18,230	12,895	5,298	18,193
Sub-total: Euston LU	41,344	34,111	75,455	41,325	34,243	75,568

Description	Future baseline plus operation 2041 AM			Old Oak Common OAPF without Overground sensitivity test 2041 AM		
Euston Square LU						
Euston Square Met (northbound/westbound)	3,590	8,878	12,468	3,596	8,900	12,496
Euston Square Met (southbound/eastbound)	11,850	8,301	20,151	11,863	8,305	20,168
Sub-total: Euston Square LU	15,440	17,179	32,619	15,459	17,205	32,664
Old Oak Common						
Old Oak Common NR slow down	4,022	10,179	14,201	4,348	12,767	17,115
Old Oak Common NR slow up	25,271	7,907	33,178	25,708	8,682	34,390
Old Oak Common NR fast down	7,284	0	7,284	7,308	0	7,308
Old Oak Common NR fast up	-	17,371	17,371	-	17,724	17,724
Old Oak Common HS2 up	-	9,477	9,477	-	9,417	9,417
Old Oak Common HS2 down	7,956	-	7,956	7,731	-	7,731
Sub-total: Old Oak Common	44,533	44,934	89,467	45,095	48,590	93,685

Demand at other stations

- 6.10.84 Table 6-355 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.
- 6.10.85 No Zone 1 stations are particularly impacted by the Old Oak Common OAPF although Ealing Broadway does experience an increase of some 580 trips as a result of additional demand attracted to the OAPF area.

Table 6-355: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	Future baseline plus operation 2041 AM	Old Oak Common OAPF without Overground sensitivity test 2041 AM	Absolute difference	% difference
Baker Street	40,198	40,739	541	1%
Tottenham Court Road	48,051	48,395	344	1%
Oxford Circus	86,079	86,416	337	0%
Charing Cross	41,480	41,789	309	1%
Liverpool Street	123,449	123,681	232	0%
Euston (inc. Euston Square)	114,718	114,911	193	0%
Farringdon	70,401	70,580	179	0%
King's Cross	55,929	56,062	133	0%
Victoria	146,426	146,326	-100	0%

Station	Future baseline plus operation 2041 AM	Old Oak Common OAPF without Overground sensitivity test 2041 AM	Absolute difference	% difference
Piccadilly Circus	18,072	17,966	-106	-1%
City Thameslink	21,842	21,734	-108	0%
Paddington	60,043	59,917	-126	0%
Sub-total	826,688	828,516	1,828	0%
Total (all Zone 1)	2,088,562	2,090,376	1,814	0%
Camden Town	18,390	18,440	50	0%
Mornington Crescent	2,922	2,909	-13	0%
Ealing Broadway	29,884	30,465	581	2%

Impact on flows

- 6.10.86 The Old Oak Common OAPF without Overground connections has a limited impact on passenger flows on the LU network as shown in Table 6-356 and Figure 6-266 with the exception of increases on the Central Line particularly in the westbound direction to/from White City (+1,400 westbound) and the Bakerloo Line, again particularly in the westbound direction from Paddington (+1,480).
- 6.10.87 There are also increases on the NLL, WLL and Crossrail towards Old Oak Common, as shown in Figure 6-267, resulting from increased employment opportunities within the OAPF. In particular, westbound Crossrail flows exhibit percentage increases of around 13% between Old Oak Common and Paddington. In addition, Table 6-356 indicates large percentage increases on WLL northbound (over 30%) and NLL northbound (over 20%) but these are lower in absolute terms (increases of 380 and 650 respectively) than for the Central and Bakerloo lines.

Table 6-356: 2041 network impacts, AM peak period

Services		Future baseline plus operation 2041 AM	Old Oak Common OAPF without Overground sensitivity test 2041 AM	% difference
Euston Classic suburban	Inbound	24,608	24,617	0%
	Outbound	4,074	4,103	1%
Euston Classic inter-city	Inbound	7,126	7,095	0%
	Outbound	2,335	2,338	0%
HS2 at Euston	Inbound	24,666	24,726	0%
	Outbound	18,269	18,494	1%
HS2 at Old Oak Common	Inbound	34,143	34,143	0%
	Outbound	26,224	26,224	0%
Sub-total at Euston	Inbound	56,400	56,438	0%

Services		Future baseline plus operation 2041 AM	Old Oak Common OAPF without Overground sensitivity test 2041 AM	% difference
	Outbound	24,678	24,935	1%
Victoria Line, north of Euston	Northbound	26,527	26,413	0%
	Southbound	66,699	66,836	0%
Victoria Line, south of Euston	Northbound	32,834	32,780	0%
	Southbound	74,254	74,433	0%
Northern Line (Bank branch), north of Euston	Northbound	21,444	21,469	0%
	Southbound	39,027	38,976	0%
Northern Line (Bank branch), south of Euston	Northbound	21,088	21,155	0%
	Southbound	40,022	39,926	0%
Northern Line (Charing Cross branch), north of Euston	Northbound	12,629	12,565	-1%
	Southbound	35,810	35,824	0%
Northern Line (Charing Cross branch), south of Euston	Northbound	14,535	14,542	0%
	Southbound	42,352	42,390	0%
Metropolitan/Hammersmith & City, Circle Line (west of Euston Square)	Eastbound	35,855	35,852	0%
	Westbound	33,379	33,851	1%
Metropolitan/Hammersmith & City, Circle Line (east of Euston Square)	Eastbound	39,404	39,409	0%
	Westbound	38,667	39,155	1%
GWML slow/Crossrail (Acton Main Line to Old Oak Common)	Eastbound	31,491	32,208	2%
	Westbound	14,042	14,418	3%
Crossrail Old Oak Common to Paddington	Eastbound	47,386	47,801	1%
	Westbound	20,200	22,837	13%
Crossrail Paddington to Bond Street	Eastbound	52,175	52,555	1%
	Westbound	25,415	27,885	10%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,722	44,108	1%
	Southbound	43,822	45,530	4%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,165	1,547	33%
	Southbound	1,596	1,622	2%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	3,013	3,661	22%
	Westbound	3,995	4,338	9%
GWML fast (Old Oak Common to	Eastbound	18,113	17,855	-1%

Services		Future baseline plus operation 2041 AM	Old Oak Common OAPF without Overground sensitivity test 2041 AM	% difference
Paddington IC)	Westbound	7,783	7,680	-1%
GWML slow (Old Oak Common to Paddington ML)	Eastbound	1,469	1,433	-2%
	Westbound	0	0	0%

Figure 6-266: LU flow differences 2041 AM peak Old Oak Common OAPF without Overground

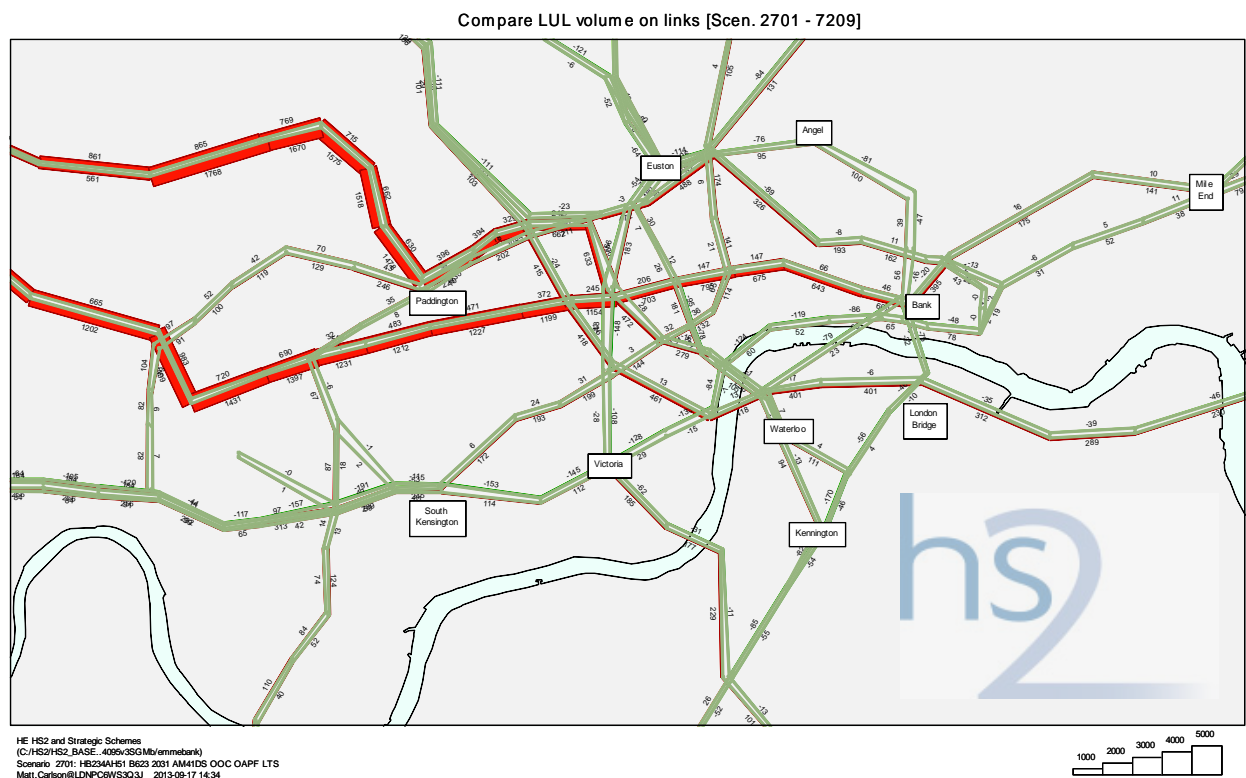


Figure 6-267: NR flow differences 2041 AM peak Old Oak Common OAPF without Overground

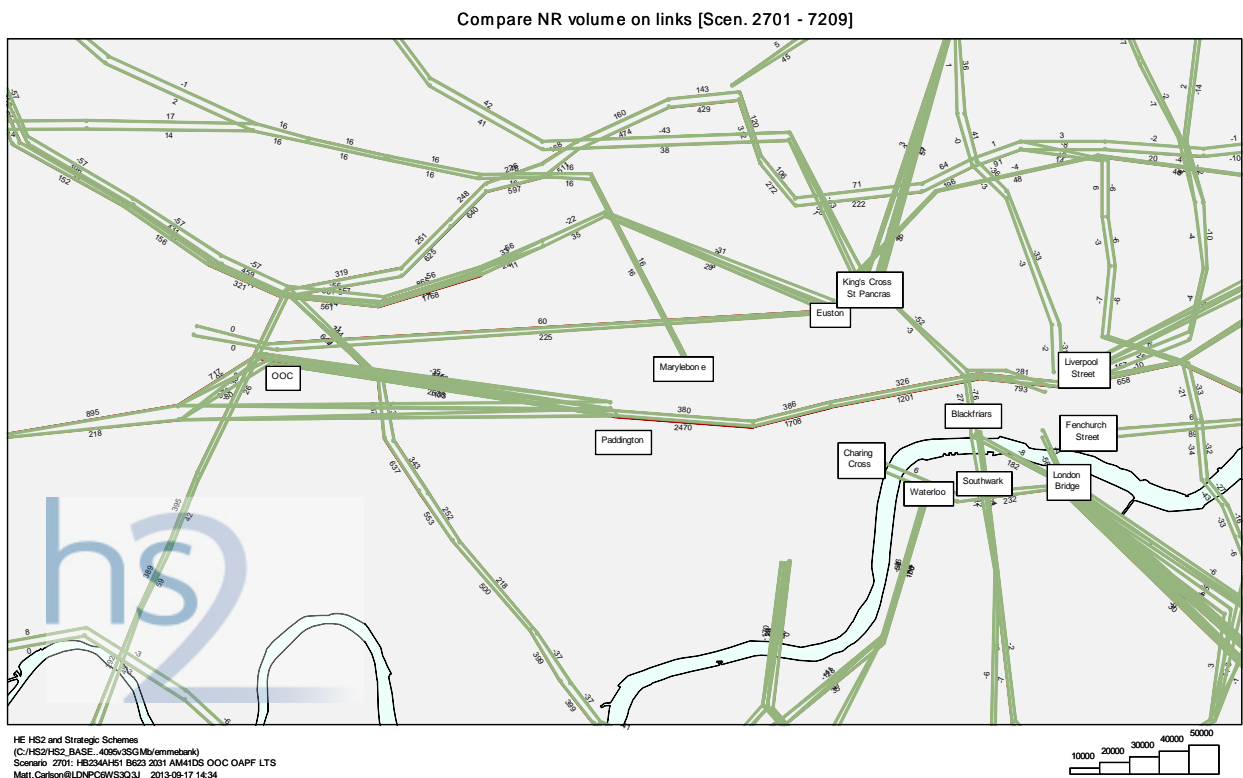
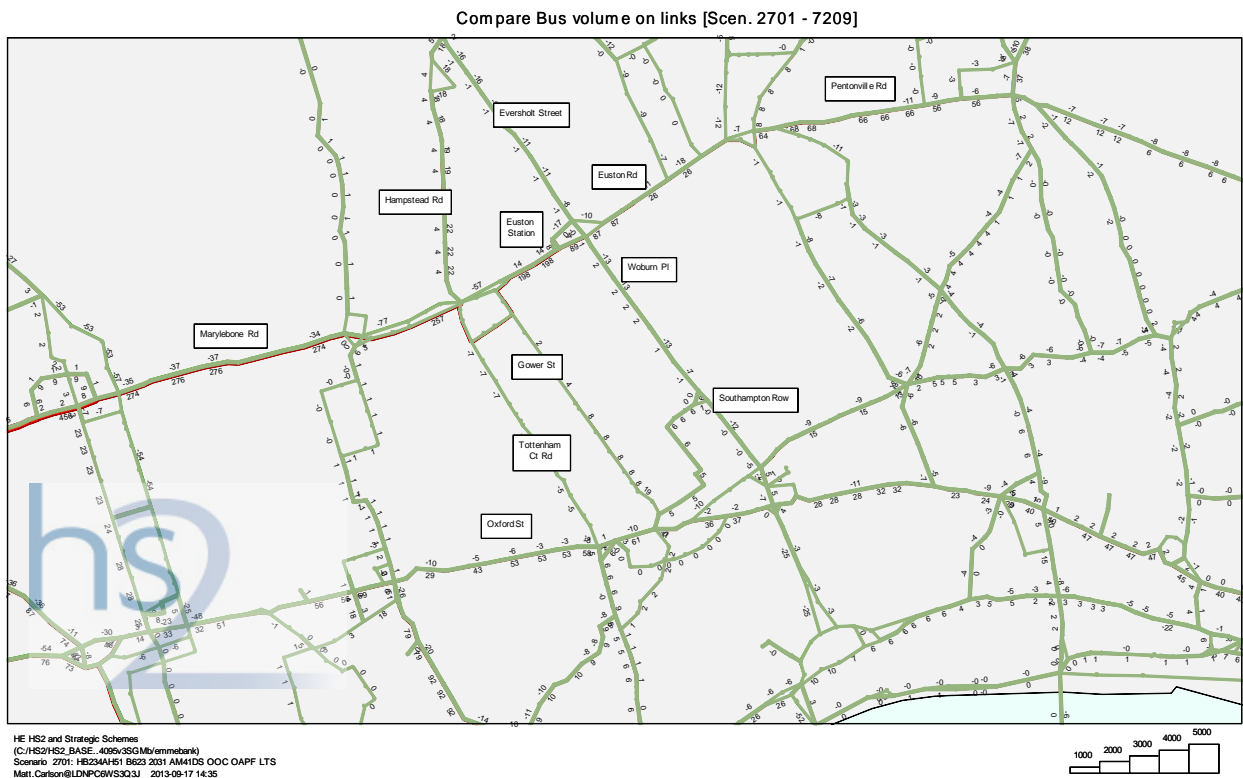


Figure 6-268: Bus flow differences 2041 AM peak Old Oak Common OAPF without Overground



Impacts at Old Oak Common

- 6.10.88 The impact of the Old Oak Common OAPF without Overground on Old Oak Common station interchange is fairly modest, with a 9% increase. The impact of the OAPF on Old Oak Common is influenced by its proximity to numerous public transport corridors and the design of the network. The change in interchange movements is quite small, which is as expected, as is the more substantial impact on the number of trips through the front door.
- 6.10.89 The number of trips leaving the station during the morning peak period increases by nearly 120%, whilst the number of trips entering the station increases by nearly 30%. This suggests that the impact of the employment opportunities rather than the residential changes has the largest impact on Old Oak Common.
- 6.10.90 It could be argued that the design of the network in Railplan is not fully capturing the amount of trips that would want to access/egress Old Oak Common to use the OAPF area. It could be suggested that one link from the development to the wider public transport network (to the east of the site, connecting to the walk and bus network, but with no direct link to Old Oak Common) may be slightly constraining, and, in reality, there might be higher usage of the station.
- 6.10.91 The sole link from the development to the bus network has a substantial impact on local buses, particularly Route 220, though all routes serving Old Oak Common experience notable passenger increases. Along Scrubs Lane, Route 220 sees load factors increase from around 85% to over 140% in both directions. The same route also shows a large increase in load factors at the route start/terminus at Willesden Junction station, indicating the significance of this station for the OAPF as well as Old Oak Common. Other routes, including 7, 72, 228 and 487, see increases in load factors on numerous route sections of between 20-50 percentage points.

Impact on crowding

- 6.10.92 Crowding for NR and LU networks is shown in Figure 6-269 and Figure 6-270. There are some limited increases in crowding to the next highest crowding band on the WLL, Crossrail through central London and westbound between Canary Wharf and Whitechapel. Increases in Crossrail crowding are shown in Figure 6-271 although no line by line graphs are reproduced for other lines due to the limited crowding impacts.

Figure 6-269: NR crowding 2041 AM peak Old Oak Common OAPF without Overground

National Rail and Tramlink Crowding
Crowded_HB234AH51: Scenario 2751

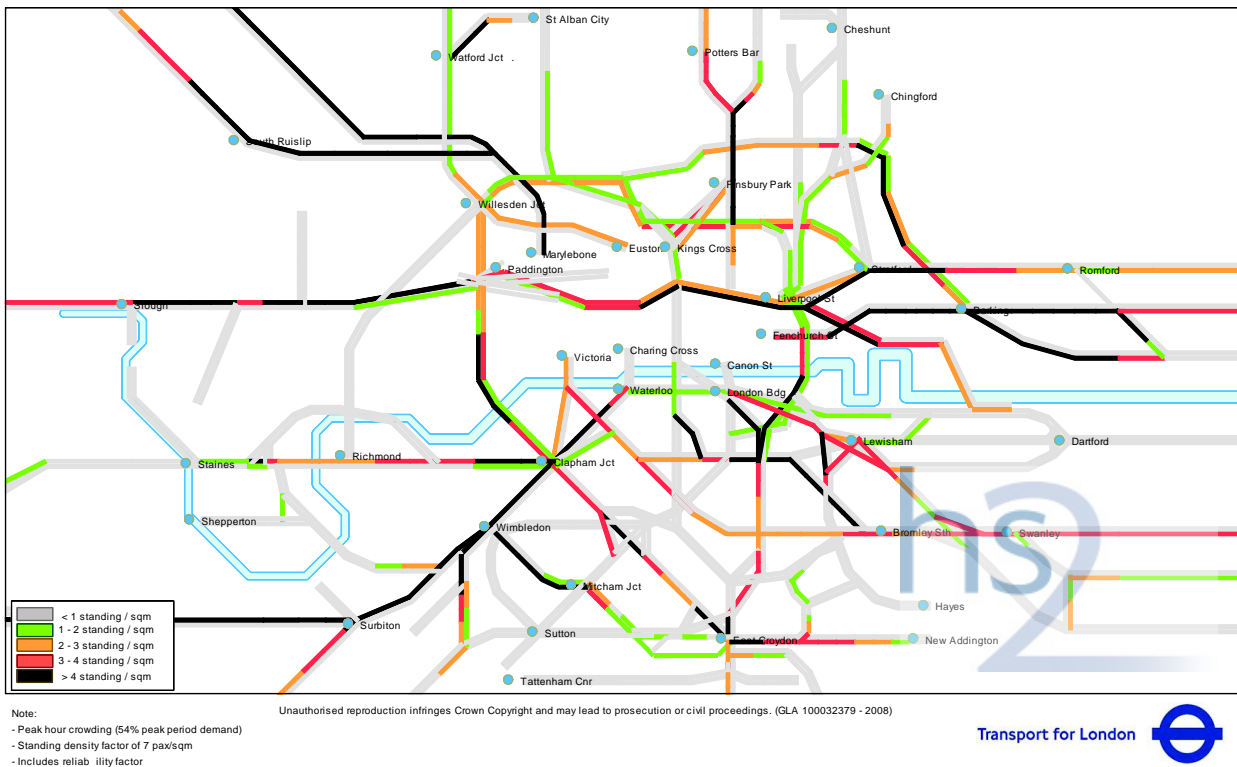


Figure 6-270: LU crowding 2041 AM peak Old Oak Common OAPF without Overground

LUL and DLR Crowding
Crowded_HB234AH51: Scenario 2751

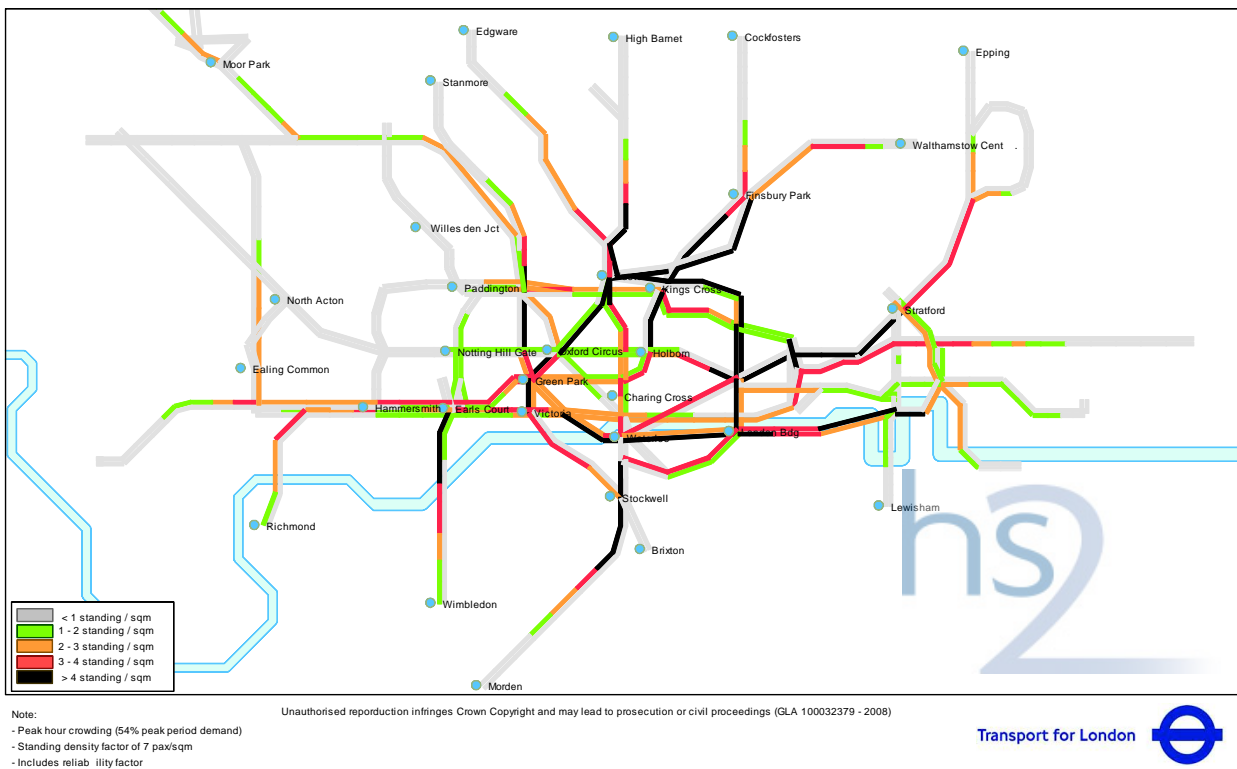
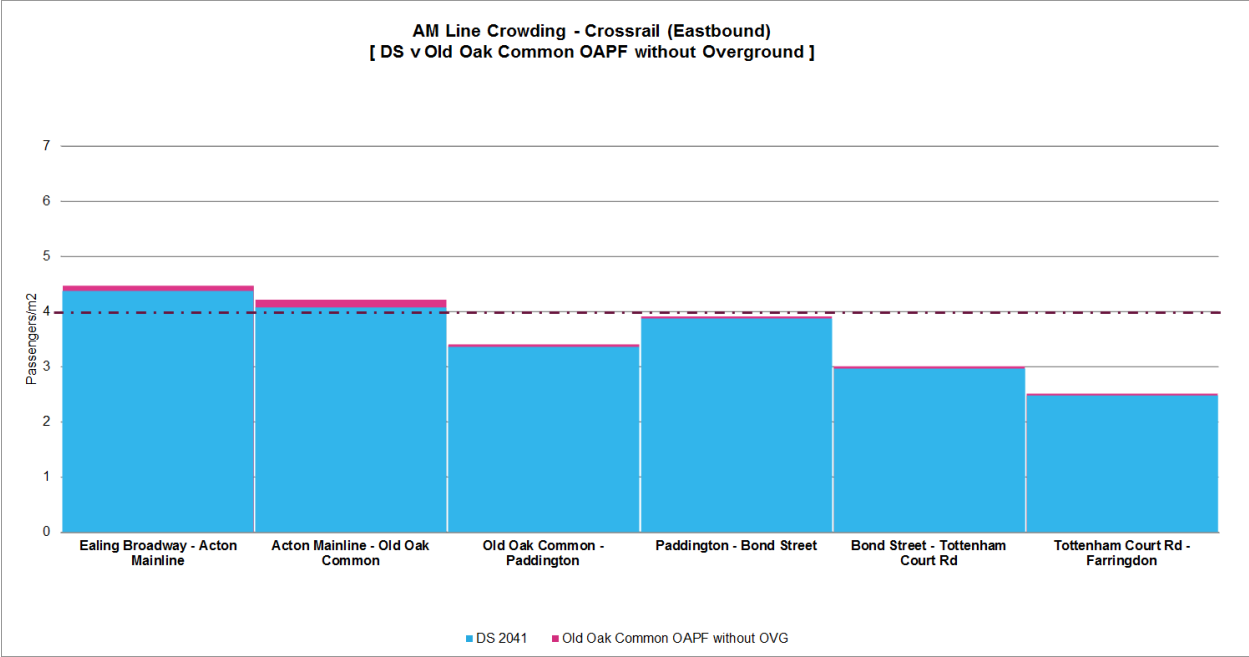


Figure 6-271: Line crowding AM 2041



Journey time impacts to HS2 passengers

6.10.93 HS2 passengers are not forecast to benefit from the Old Oak Common OAPF, with minimal changes to onward weighted journey times.

Summary

6.10.94 The inclusion of the OAPF development at Old Oak Common would see demand for Old Oak Common station substantially increase. However, fewer HS2 passengers use Old Oak Common station due to increased crowding on Crossrail services, reducing their attractiveness at Old Oak Common station.

Old Oak Common OAPF with Overground

Scheme description

- 6.10.95 This sensitivity test combines the transport supply changes from the Old Oak Common Overground connectivity sensitivity test with the 24,000 homes and 55,000 jobs assumed in the OAPF sensitivity test. This scenario adds Old Oak Common Overground connectivity to the OAPF area in addition to access from the new Old Oak Common station (HS2, GWML and Crossrail) and via Willesden Junction (NLL and WLL), East Acton (Central Line) and Harlesden (WLL).

Comparison with 2041 AM Proposed Scheme

Station demand

- 6.10.96 Table 6-357 shows the balance of HS2 flows between Euston and Old Oak Common in this sensitivity test is very similar to that in the Overground Connectivity (without OAPF) sensitivity test with a reduction in boarders and alighters at Euston and a compensating increase at Old Oak Common. There are increases in all boarders and alighters at Old Oak Common due to the cumulative impact of improved connectivity and increased employment opportunities. The largest increases are from westbound NR slow services where boarders and alighters increase by some 15%. Overground changes are picked up in the Overground Acton Central to Willesden Junction (NLL) and Overground Shepherd's Bush to Willesden Junction (WLL) line flows of Table 6-359.

Table 6-357: 2041 AM Euston station demand, 07:00-10:00

Description	Future baseline plus operation 2041 AM			Old Oak Common OAPF with Overground sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (down)	4,074	-	4,074	4,071	-	4,071
Euston suburban (up)	-	24,608	24,608	-	24,608	24,608
Euston inter-city (down)	2,335	-	2,335	2,338	-	2,338
Euston inter-city/other (up)	-	7,126	7,126	-	7,114	7,114
Euston HS2 (up)	-	24,666	24,666	-	23,407	23,407
Euston HS2 (down)	18,269	-	18,269	16,334	-	16,334
Sub-total: Euston NR	24,678	56,400	81,078	22,743	55,129	77,872
Euston LU						
Euston Northern (Charing Cross northbound)	2,333	4,239	6,572	2,279	3,669	5,948
Euston Northern (Charing Cross southbound)	9,092	2,550	11,642	8,595	2,484	11,079
Euston Northern (Bank northbound)	4,174	3,819	7,993	4,128	3,794	7,922
Euston Northern (Bank southbound)	9,237	8,241	17,478	9,242	8,272	17,514
Euston Victoria (northbound)	3,616	9,924	13,540	3,554	9,260	12,814
Euston Victoria (southbound)	12,892	5,338	18,230	12,654	5,272	17,926
Sub-total: Euston LU	41,344	34,111	75,455	40,452	32,751	73,203

Description	Future baseline plus operation 2041 AM			Old Oak Common OAPF with Overground sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston Square LU						
Euston Square Met (northbound/westbound)	3,590	8,878	12,468	3,484	8,729	12,213
Euston Square Met (southbound/eastbound)	11,850	8,301	20,151	11,677	8,003	19,680
Sub-total: Euston Square LU	15,440	17,179	32,619	15,161	16,732	31,893
Old Oak Common						
Old Oak Common NR slow down	4,022	10,179	14,201	4,437	11,711	16,148
Old Oak Common NR slow up	25,271	7,907	33,178	25,593	8,100	33,693
Old Oak Common NR fast down	7,284	0	7,284	7,530	0	7,530
Old Oak Common NR fast up	-	17,371	17,371	-	18,481	18,481
Old Oak Common HS2 up	-	9,477	9,477	-	10,736	10,736
Old Oak Common HS2 down	7,956	-	7,956	9,890	-	9,890
Sub-total: Old Oak Common	44,533	44,934	89,467	47,450	49,028	96,478

Demand at other stations

- 6.10.97 Table 6-358 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.
- 6.10.98 There are limited increases at some stations but larger reductions particularly at Waterloo, Paddington, Victoria and Euston as a result of additional capacity to/from Old Oak Common which reduces passenger loadings on HS2 between Old Oak Common and Euston and diverts passengers from Paddington, Victoria and Waterloo due to WLL and NLL improvements, together with the generative impacts (through LTS) of additional capacity.

Table 6-358: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	Future baseline plus operation 2041 AM	Old Oak Common OAPF with Overground sensitivity test 2041 AM	Absolute difference	% difference
Baker Street	40,198	40,647	449	1%
Tottenham Court Road	48,051	48,289	238	0%
Charing Cross	41,480	41,701	221	1%
Liverpool Street	123,449	123,635	186	0%
Warren Street	16,929	17,083	154	1%
City Thameslink	21,842	21,737	-105	0%
Elephant & Castle	22,651	22,534	-117	-1%

Station	Future baseline plus operation 2041 AM	Old Oak Common OAPF with Overground sensitivity test 2041 AM	Absolute difference	% difference
Piccadilly Circus	18,072	17,954	-118	-1%
Gloucester Road	12,176	12,049	-127	-1%
London Bridge	171,504	171,353	-151	0%
Goodge Street	21,091	20,914	-177	-1%
Notting Hill Gate	11,917	11,710	-207	-2%
South Kensington	25,741	25,489	-252	-1%
Leicester Square	27,444	27,180	-264	-1%
Moorgate	35,533	35,242	-291	-1%
Bond Street	67,789	67,392	-397	-1%
Farringdon	70,401	69,888	-513	-1%
Oxford Circus	86,079	85,217	-862	-1%
Waterloo	144,306	142,917	-1,389	-1%
Paddington	60,043	57,711	-2,332	-4%
Euston (inc. Euston Square)	114,718	111,554	-3,164	-3%
Victoria	146,426	143,225	-3,201	-2%
City Thameslink	21,842	21,737	-105	0%
Elephant & Castle	22,651	22,534	-117	-1%
Piccadilly Circus	18,072	17,954	-118	-1%
Gloucester Road	12,176	12,049	-127	-1%
London Bridge	171,504	171,353	-151	0%
Goodge Street	21,091	20,914	-177	-1%
Notting Hill Gate	11,917	11,710	-207	-2%
South Kensington	25,741	25,489	-252	-1%
Sub-total	1,632,834	1,619,161	-13,673	-1%
Total (all Zone 1)	2,088,562	2,076,324	-12,238	-1%
Camden Town	18,390	18,304	-86	0%
Mornington Crescent	2,922	2,905	-17	-1%
Ealing Broadway	29,884	29,714	-170	-1%

Impact on flows

6.10.99 Table 6-359 and Figure 6-272 to Figure 6-274 show the passenger flow impact of the Old Oak Common and Overground Connectivity test. As well as the reduction in HS2 flows into and out of Euston, there are increases towards Old Oak Common on the WLL (+3,260) and NLL (+1,500), on the eastbound Bakerloo Line towards Paddington and the Central Line in both directions west of Shepherd's Bush (where passengers interchange onto the WLL). Crossrail demand also increases, particularly in the westbound direction.

Table 6-359: 2041 network impacts, AM peak period

Services		Future baseline plus operation 2041 AM	Old Oak Common OAPF with Overground sensitivity test 2041 AM	% difference
Euston Classic suburban	Inbound	24,608	24,608	0%
	Outbound	4,074	4,071	0%
Euston Classic inter-city	Inbound	7,126	7,114	0%
	Outbound	2,335	2,338	0%
HS2 at Euston	Inbound	24,666	23,407	-5%
	Outbound	18,269	16,334	-11%
HS2 at Old Oak Common	Inbound	34,143	34,143	0%
	Outbound	26,224	26,224	0%
Sub-total at Euston	Inbound	56,400	55,129	-2%
	Outbound	24,678	22,743	-8%
Victoria Line, north of Euston	Northbound	26,527	26,579	0%
	Southbound	66,699	66,873	0%
Victoria Line, south of Euston	Northbound	32,834	32,285	-2%
	Southbound	74,254	74,256	0%
Northern Line (Bank branch), north of Euston	Northbound	21,444	21,309	-1%
	Southbound	39,027	38,895	0%
Northern Line (Bank branch), south of Euston	Northbound	21,088	20,975	-1%
	Southbound	40,022	39,866	0%
Northern Line (Charing Cross branch), north of Euston	Northbound	12,629	12,443	-1%
	Southbound	35,810	35,788	0%
Northern Line (Charing Cross branch), south of Euston	Northbound	14,535	13,834	-5%
	Southbound	42,352	41,900	-1%
Metropolitan/Hammersmith & City, Circle Line (west of Euston Square)	Eastbound	35,855	35,517	-1%
	Westbound	33,379	33,597	1%

Metropolitan/Hammersmith & City, Circle Line (east of Euston Square)	Eastbound	39,404	39,192	-1%
	Westbound	38,667	38,842	0%
GWML slow/Crossrail (Acton Main Line to Old Oak Common)	Eastbound	31,491	31,667	1%
	Westbound	14,042	14,477	3%
Crossrail Old Oak Common to Paddington	Eastbound	47,386	47,765	1%
	Westbound	20,200	21,752	8%
Crossrail Paddington to Bond Street	Eastbound	52,175	52,582	1%
	Westbound	25,415	27,362	8%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,722	44,046	1%
	Southbound	43,822	45,169	3%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,165	2,667	129%
	Southbound	1,596	1,246	-22%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	3,013	5,847	94%
	Westbound	3,995	7,260	82%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	18,113	17,124	-5%
	Westbound	7,783	7,496	-4%
GWML slow (Old Oak Common to Paddington ML)	Eastbound	1,469	1,395	-5%
	Westbound	0	0	0%

Figure 6-272: LU flow differences 2041 AM peak Old Oak Common OAPF with Overground

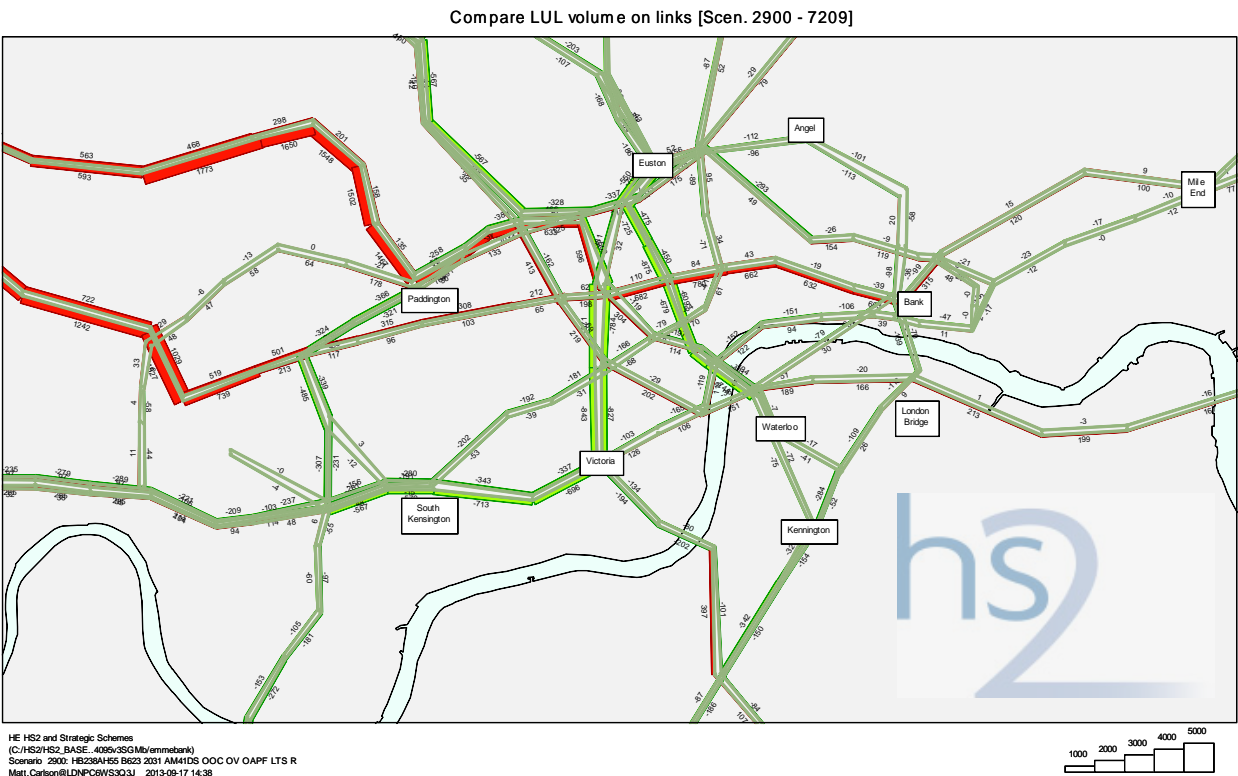


Figure 6-273: NR flow differences 2041 AM peak Old Oak Common OAPF with Overground

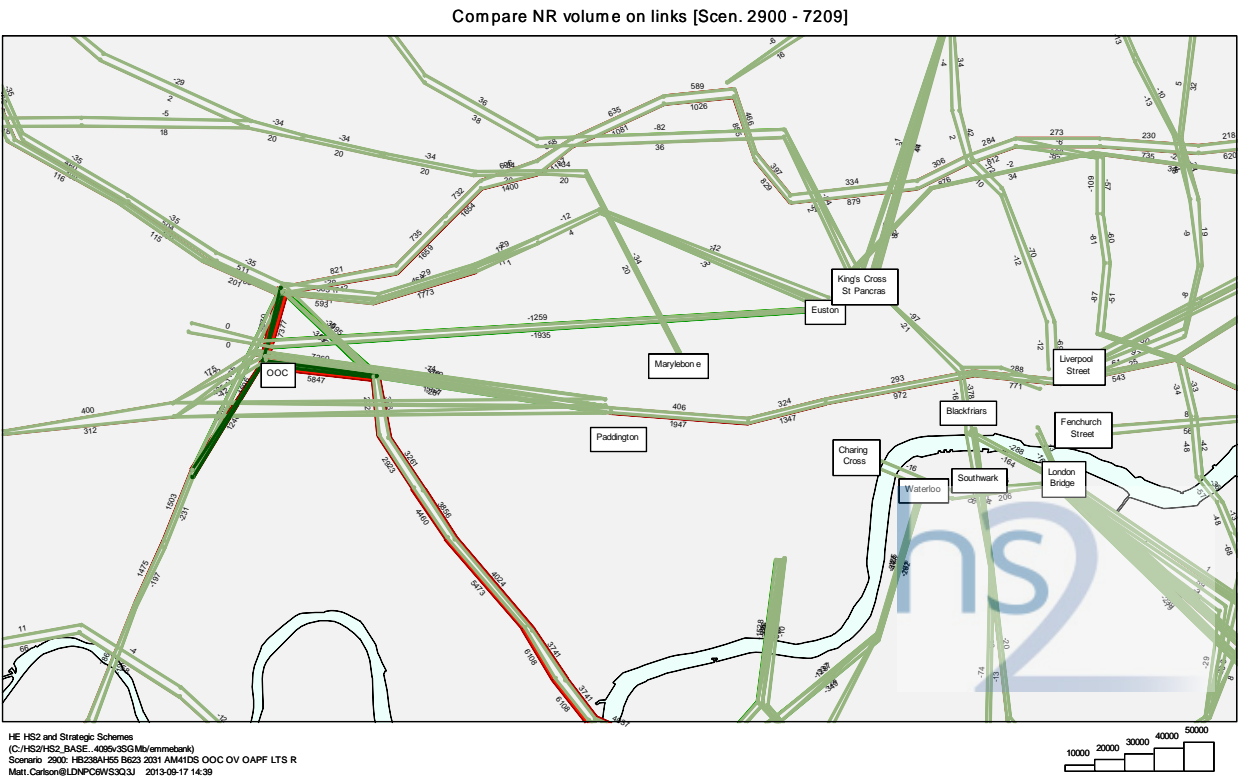
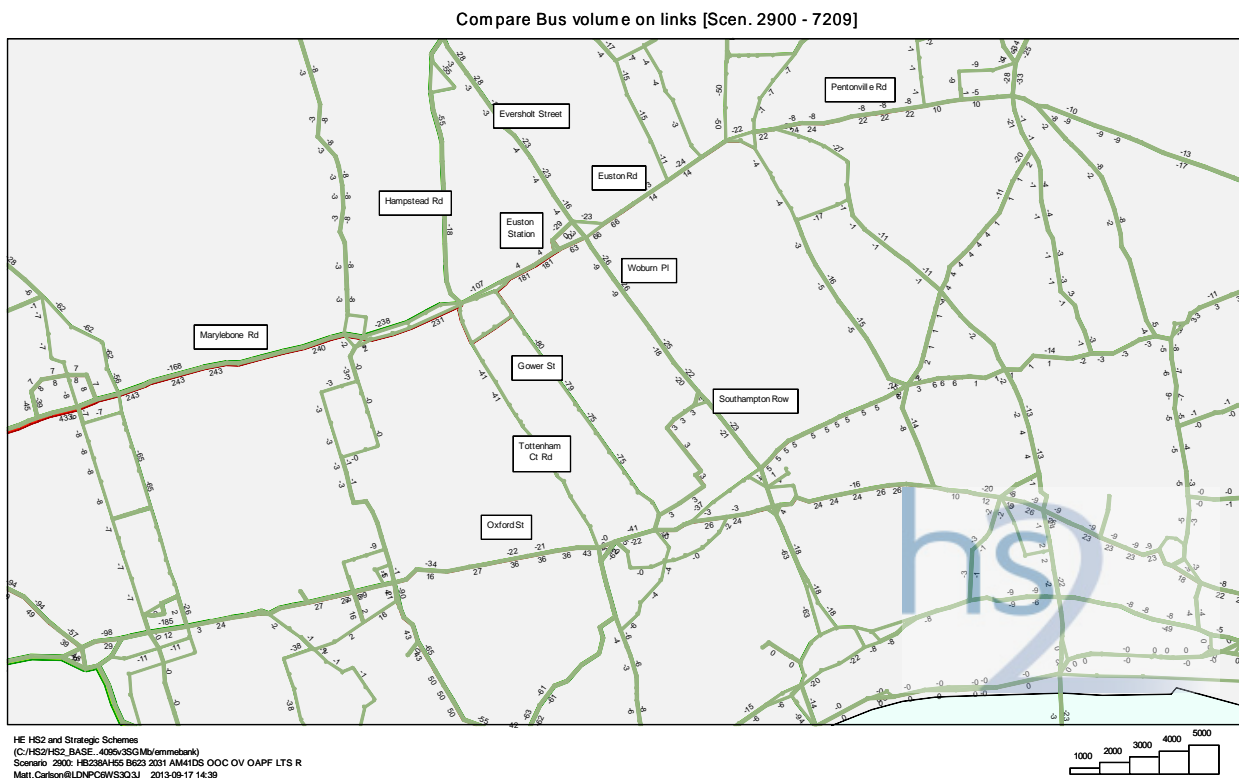


Figure 6-274: Bus flow differences 2041 AM peak Old Oak Common OAPF with Overground



Impact at Old Oak Common

- 6.10.100 The impact of the Old Oak Common OAPF with Overground test on station interchange is, as expected, similar to the net impact of the London Overground connectivity test and the OAPF without London Overground test. Overall, the number of station movements increases by nearly 30% over the future baseline; many of these movements are new interchange opportunities, suggesting alleviation of boarders and alighters at Euston and Paddington - for example the large numbers of trips using westbound HS2 services interchanging from London Overground.
- 6.10.101 This scenario has a large impact on front door access/egress movements. Station egress increases by 130%, driven by the large increase in employment opportunities in the OAPF, and the new rail access to the local area from the north and south on London Overground. Crossrail trains from central London serve the majority of these trips. The reduction in the number of movements between HS2 eastbound and the station entrance (-37%) suggests that London Overground services are in competition with local buses.
- 6.10.102 As with the OAPF without Overground test, the design and implementation of the OAPF development will impact on the front door flows and volumes on local buses. If there were direct walk links between the site and Old Oak Common station, for example, there may be higher usage of the station. The relationship between connectivity between the OAPF and Willesden Junction station will also be important as this station will be in competition with Old Oak Common.
- 6.10.103 The impact on local buses in this scenario is very similar to that seen in the OAPF without Overground scenario; there are substantial increases in load factors on Routes 228, 220, 487 and 7,

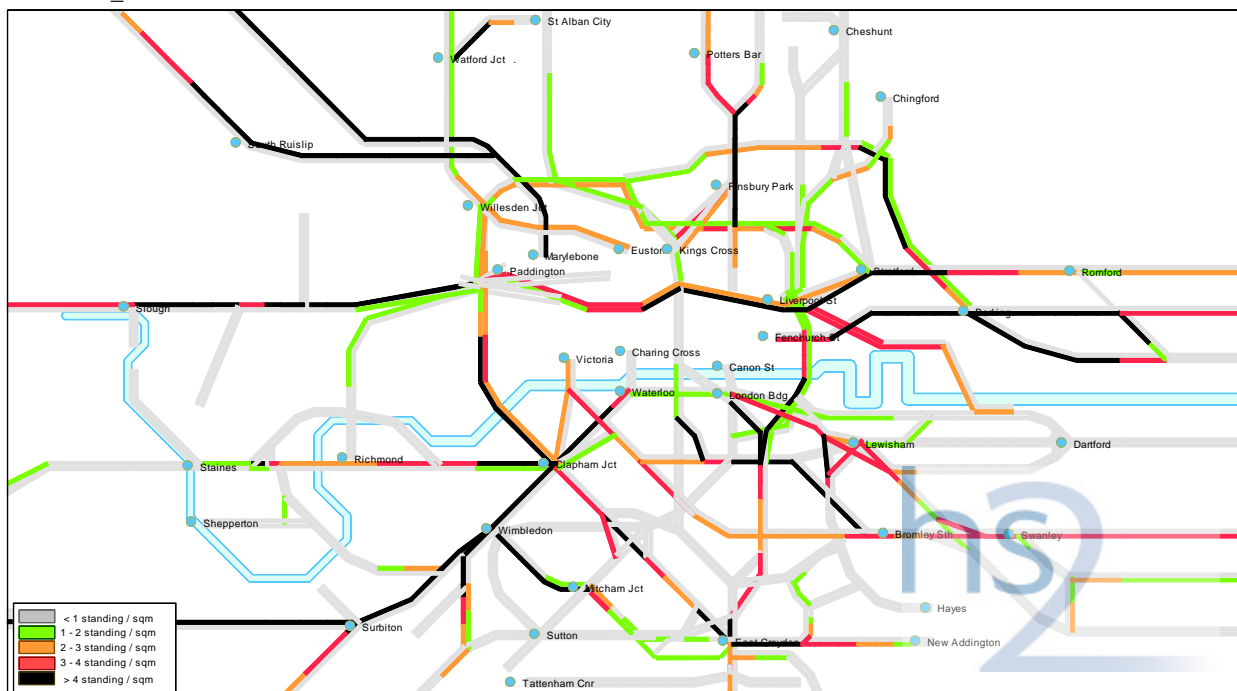
with the scale of load factor change being between 10 to 50 percentage points. Route 72, the north-south route serving Old Oak Common, exhibits the expected pattern; at certain points of the route, the inclusion of Overground services alleviates crowding, although this is offset by increased loads due to OAPF passengers.

Impact on crowding

- 6.10.104 Crowding for NR and LU networks is shown in Figure 6-275 and Figure 6-276. The introduction of Overground connections with the Old Oak Common OAPF results in some crowding increases to the next highest band of crowding on the WLL from Clapham Junction northbound, on the NLL eastbound towards Old Oak Common and on Crossrail between Bond Street and Tottenham Court Road in both directions.
- 6.10.105 No LU line by line graphs are reproduced for this sensitivity test due to the limited crowding impacts.

Figure 6-275: NR crowding 2041 AM peak Old Oak Common OAPF with Overground

National Rail and Tramlink Crowding
Crowded_HB238AH55: Scenario 2950

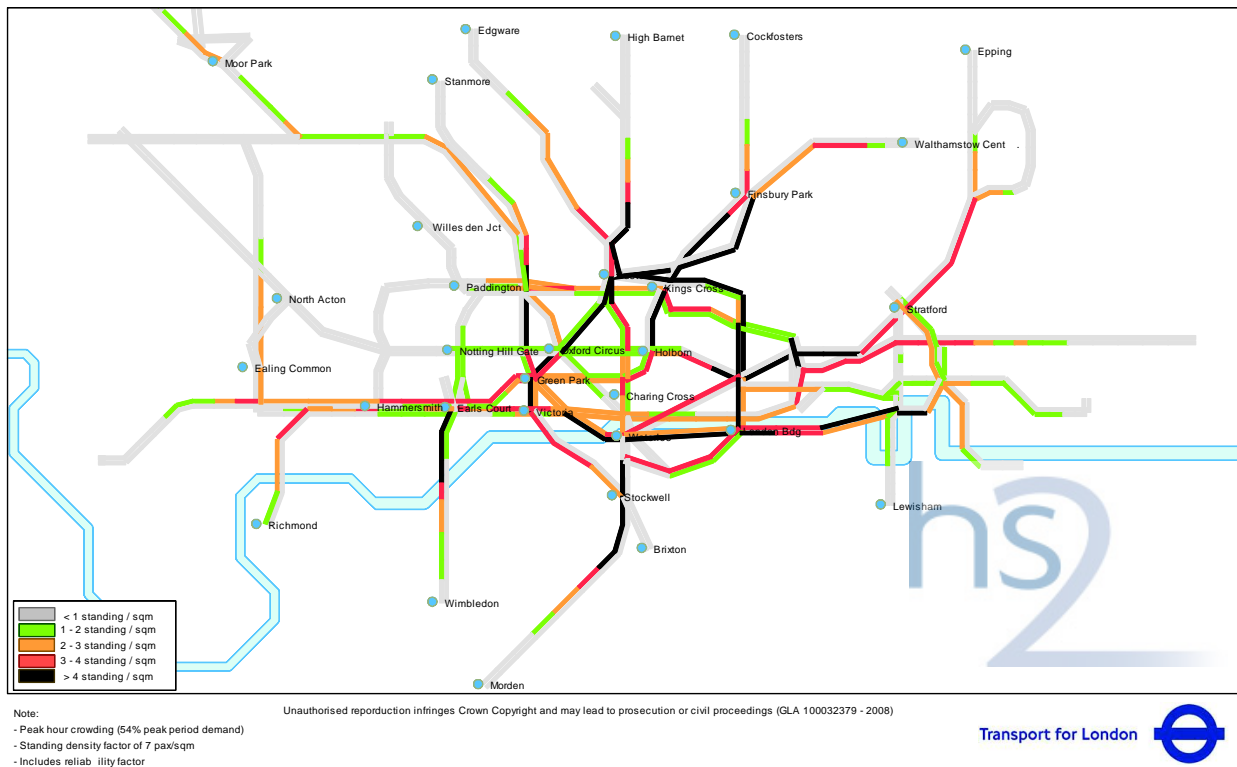


Note:
- Peak hour crowding (54% peak period demand)
- Standing density factor of 7 pax/sqm
- Includes reliability factor

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Figure 6-276: LU crowding 2041 AM peak Old Oak Common OAPF with Overground

LUL and DLR Crowding
Crowded_HB238AH55: Scenario 2950



Journey time impacts to HS2 passengers

- 6.10.106 HS2 passengers are forecast to save a total of nearly 800 weighted hours between 07:00 and 10:00 as a result of the Old Oak Common OAPF with Overground connectivity, mainly brought about by improved access to Old Oak Common station. The savings are slightly lower than the Overground connectivity (without the OAPF) scenario due to the additional boardings and alightings at Old Oak Common, increasing crowding and hence weighted journey times.

Summary

- 6.10.107 The inclusion of the OAPF development at Old Oak Common would see demand for Old Oak Common station substantially increase. The addition of the Overground station helps to facilitate the additional demand resulting from the OAPF, but NLL and WLL services would be very crowded. The impact on HS2 passengers is very similar to that reported for the Overground connection alone without the OAPF development added.

Additional supply enhancements

6.10.108 This sensitivity test increases the capacity of LU and Overground services in line with TfL aspirations over and above committed upgrades. LTS was rerun in order to derive the trip generation, redistribution and mode shift impacts of these enhancements. The assumed enhancements were:

- Victoria Line 36 tph from a maximum of 33 tph in the base, still with a proportion reversing at Seven Sisters;
- Jubilee Line: 36 tph from a maximum of 30 tph in the base, still with a proportion reversing at North Greenwich, Willesden Green and Wembley Park;
- Northern Line full separation: 33 tph in both directions on the Bank branch from 30 tph Southbound in the base;
- Central Line upgrade (330 seats, 1,564 total capacity at seven passengers per square metre replacing current stock with 272 seats, 1,357 total capacity);
- 6 car class 378 on all East, West and North London Line services.

6.10.109 The frequency of the Victoria Line services was amended as set out in Table 6-360.

Table 6-360: Enhanced Victoria Line services, 2041 AM

From – to	tph	
	Current	Proposed
Brixton – Walthamstow Central	22	25
Brixton – Seven Sisters	11	11
Walthamstow Central – Brixton	22	25
Seven Sisters – Brixton	11	11

6.10.110 The amended scenario assumes a full 36 tph will be provided across the peak period with no peak hour factoring required. The current trains per hour were factored by 93% to provide the average trains per hour across the peak period.

Comparison with 2041 AM Proposed Scheme

Station demand

6.10.111 Table 6-361 shows that there is a negligible impact on rail flows into Euston and hence the balance of HS2 flows between Euston and Old Oak Common is virtually unchanged. As the focus is on LU improvements, the major flow increases at Euston are on the Victoria Line (+4,000 boarders) and Northern Line Charing Cross branch (+3,480 alighters). Overall, LU boarders and alighters at Euston increase by 15% with a slight reduction at Euston Square. Within Euston LU station, an extra 3,500 (57%) change from Northern City branch southbound to the Victoria line southbound and an extra 1,000 (29%) from Victoria Line northbound to HS2.

Table 6-361: 2041 AM Euston station demand, 07:00-10:00

Description	Future baseline plus operation 2041 AM			Additional supply enhancements sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (down)	4,074	-	4,074	4,102	-	4,102
Euston suburban (up)	-	24,608	24,608	-	24,529	24,529
Euston inter-city (down)	2,335	-	2,335	2,344	-	2,344
Euston inter-city/other (up)	-	7,126	7,126	-	7,078	7,078
Euston HS2 (up)	-	24,666	24,666	-	24,576	24,576
Euston HS2 (down)	18,269	-	18,269	18,489	-	18,489
Sub-total: Euston NR	24,678	56,400	81,078	24,935	56,183	81,118
Euston LU						
Euston Northern (Charing Cross northbound)	2,333	4,239	6,572	2,518	3,356	5,874
Euston Northern (Charing Cross southbound)	9,092	2,550	11,642	8,864	2,697	11,561
Euston Northern (Bank northbound)	4,174	3,819	7,993	4,517	3,803	8,320
Euston Northern (Bank southbound)	9,237	8,241	17,478	9,709	11,724	21,433
Euston Victoria (northbound)	3,616	9,924	13,540	4,060	11,675	15,735
Euston Victoria (southbound)	12,892	5,338	18,230	16,930	5,967	22,897
Sub-total: Euston LU	41,344	34,111	75,455	46,598	39,222	85,820
Euston Square LU						
Euston Square Met (northbound/westbound)	3,590	8,878	12,468	3,431	8,605	12,036
Euston Square Met (southbound/eastbound)	11,850	8,301	20,151	11,361	8,204	19,565
Sub-total: Euston Square LU	15,440	17,179	32,619	14,792	16,809	31,601
Old Oak Common						
Old Oak Common NR slow down	4,022	10,179	14,201	3,952	9,598	13,550
Old Oak Common NR slow up	25,271	7,907	33,178	25,202	7,709	32,911
Old Oak Common NR fast down	7,284	0	7,284	7,076	0	7,076
Old Oak Common NR fast up	-	17,371	17,371	-	17,499	17,499
Old Oak Common HS2 up	-	9,477	9,477	-	9,567	9,567
Old Oak Common HS2 down	7,956	-	7,956	7,735	-	7,735
Sub-total: Old Oak Common	44,533	44,934	89,467	43,965	44,373	88,338

Demand at other stations

- 6.10.112 Table 6-362 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the 3 hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.
- 6.10.113 There is a net increase in Zone 1 activity of over 20,000 access, egress and interchange movements with particularly large increases at Green Park, Oxford Circus, London Bridge, Bond Street, Euston, Southwark and Westminster, reflecting enhancements on the Victoria, Jubilee, Northern and Central Lines.

Table 6-362: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	Future baseline plus operation 2041 AM	Additional supply enhancements sensitivity test 2041 AM	Absolute difference	% difference
Green Park	56,147	64,345	8,198	15%
Oxford Circus	86,079	93,927	7,848	9%
London Bridge	171,504	178,484	6,980	4%
Bond Street	67,789	73,476	5,687	8%
Euston (inc. Euston Square)	114,718	119,035	4,317	4%
Southwark	14,035	17,426	3,391	24%
Westminster	26,650	29,901	3,251	12%
Pimlico	15,642	16,851	1,209	8%
Holborn	33,486	34,648	1,162	3%
Victoria	146,426	147,556	1,130	1%
Chancery Lane	16,417	17,543	1,126	7%
Warren Street	16,929	17,839	910	5%
Notting Hill Gate	11,917	12,660	743	6%
Baker Street	40,198	40,806	608	2%
King's Cross	55,929	56,280	351	1%
Old Street	21,263	21,611	348	2%
Marble Arch	6,616	6,957	341	5%
Knightsbridge	12,562	12,893	331	3%
Lancaster Gate	2,053	2,369	316	15%
St Paul's	2,562	2,874	312	12%
Queensway	3,247	3,545	298	9%
Temple	21,422	21,651	229	1%

Station	Future baseline plus operation 2041 AM	Additional supply enhancements sensitivity test 2041 AM	Absolute difference	% difference
Edgware Road (SSL)	7,186	7,072	-114	-2%
Regent's Park	5,501	5,378	-123	-2%
Marylebone	23,414	23,247	-167	-1%
Aldgate East	15,335	15,164	-171	-1%
Russell Square	8,235	8,006	-229	-3%
Hyde Park Corner	3,823	3,583	-240	-6%
Tower Gateway	3,014	2,733	-281	-9%
Aldgate	15,337	15,048	-289	-2%
Piccadilly Circus	18,072	17,739	-333	-2%
South Kensington	25,741	25,396	-345	-1%
Tower Hill	15,543	15,170	-373	-2%
Monument	6,319	5,912	-407	-6%
Bank	98,244	97,704	-540	-1%
Blackfriars	28,725	28,166	-559	-2%
St James's Park	18,632	18,032	-600	-3%
City Thameslink	21,842	21,192	-650	-3%
St Pancras	20,227	19,414	-813	-4%
Fenchurch Street	36,414	35,541	-873	-2%
Waterloo East	8,011	7,129	-882	-11%
Great Portland Street	13,473	12,522	-951	-7%
Waterloo	144,306	143,196	-1,110	-1%
Embankment	29,944	28,772	-1,172	-4%
Moorgate	35,533	34,335	-1,198	-3%
Goodge Street	21,091	19,820	-1,271	-6%
Paddington	60,043	58,684	-1,359	-2%
Leicester Square	27,444	25,956	-1,488	-5%
Farringdon	70,401	68,849	-1,552	-2%
Cannon Street	44,322	42,396	-1,926	-4%
Elephant & Castle	22,651	20,698	-1,953	-9%
Charing Cross	41,480	39,101	-2,379	-6%

Station	Future baseline plus operation 2041 AM	Additional supply enhancements sensitivity test 2041 AM	Absolute difference	% difference
Liverpool Street	123,449	120,614	-2,835	-2%
Sub-total	1,957,343	1,979,246	21,903	1%
Total (all Zone 1)	2,088,562	2,110,689	22,127	1%
Camden Town	18,390	32,481	14,091	77%
Mornington Crescent	2,922	2,911	-11	0%
Ealing Broadway	29,884	29,968	84	0%

Impact on flows

- 6.10.114 Table 6-363 and Figure 6-277 to Figure 6-279 show the passenger flow impact of the additional supply enhancements sensitivity test compared with the future baseline plus operation. The LU network shows substantial increases on the Victoria, Jubilee, Northern and Central Lines. There are increases on the Northern Line Bank branch (+4,700 southbound north of Euston, but -3,400 on the Charing Cross branch southbound north of Euston), Jubilee Line (+11,000 between London Bridge and Waterloo), Victoria Line (+10,000 southbound south of Euston) and the Central Line (+4,000 westbound west of Bank). The changes on the Northern Line reflect the change in connectivity between the separate northern branches at Camden Town and the branches at Euston. Without Northern Line separation, both northern branches would feed both city branches, whereas with separation, they are separate.
- 6.10.115 There are reductions on Crossrail (-2,000 eastbound, -3,000 westbound) west of Farringdon which is a direct transfer to the Central Line.
- 6.10.116 With the exception of the ELL (+880 northbound to Whitechapel) and WLL (+270 southbound at Shepherds Bush), there are no other discernible impacts on NR. Buses experience a general reduction, particularly on routes paralleling upgraded LU lines, most noticeable on the Baker Street corridor.

Table 6-363: 2041 network impacts, AM peak period

Services		Future baseline plus operation 2041 AM	Additional supply enhancements sensitivity test 2041 AM	% difference
Euston Classic suburban	Inbound	24,608	24,529	0%
	Outbound	4,074	4,102	1%
Euston Classic inter-city	Inbound	7,126	7,078	-1%
	Outbound	2,335	2,344	0%
HS2 at Euston	Inbound	24,666	24,576	0%
	Outbound	18,269	18,489	1%

Services		Future baseline plus operation 2041 AM	Additional supply enhancements sensitivity test 2041 AM	% difference
HS2 at Old Oak Common	Inbound	34,143	34,143	0%
	Outbound	26,224	26,224	0%
Sub-total at Euston	Inbound	56,400	56,183	0%
	Outbound	24,678	24,935	1%
Victoria Line, north of Euston	Northbound	26,527	28,950	9%
	Southbound	66,699	73,528	10%
Victoria Line, south of Euston	Northbound	32,834	36,565	11%
	Southbound	74,254	84,492	14%
Northern Line (Bank branch), north of Euston	Northbound	21,444	21,246	-1%
	Southbound	39,027	43,755	12%
Northern Line (Bank branch), south of Euston	Northbound	21,088	20,531	-3%
	Southbound	40,022	41,740	4%
Northern Line (Charing Cross branch), north of Euston	Northbound	12,629	13,069	3%
	Southbound	35,810	32,381	-10%
Northern Line (Charing Cross branch), south of Euston	Northbound	14,535	13,906	-4%
	Southbound	42,352	38,548	-9%
Metropolitan/Hammersmith & City, Circle Line (west of Euston Square)	Eastbound	35,855	34,922	-3%
	Westbound	33,379	31,621	-5%
Metropolitan/Hammersmith & City, Circle Line (east of Euston Square)	Eastbound	39,404	38,080	-3%
	Westbound	38,667	36,795	-5%
GWML slow/Crossrail (Acton Main Line to Old Oak Common)	Eastbound	31,491	30,871	-2%
	Westbound	14,042	14,122	1%
Crossrail Old Oak Common to Paddington	Eastbound	47,386	46,918	-1%
	Westbound	20,200	19,769	-2%
Crossrail Paddington to Bond Street	Eastbound	52,175	50,839	-3%
	Westbound	25,415	24,663	-3%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,722	41,588	-5%
	Southbound	43,822	41,076	-6%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,165	1,227	5%
	Southbound	1,596	1,598	0%

Services		Future baseline plus operation 2041 AM	Additional supply enhancements sensitivity test 2041 AM	% difference
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	3,013	3,140	4%
	Westbound	3,995	4,310	8%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	18,113	17,971	-1%
	Westbound	7,783	8,034	3%
GWML slow (Old Oak Common to Paddington ML)	Eastbound	1,469	1,445	-2%
	Westbound	0	0	0%

Figure 6-277: LU flow differences 2041 AM peak TfL capacity enhancements

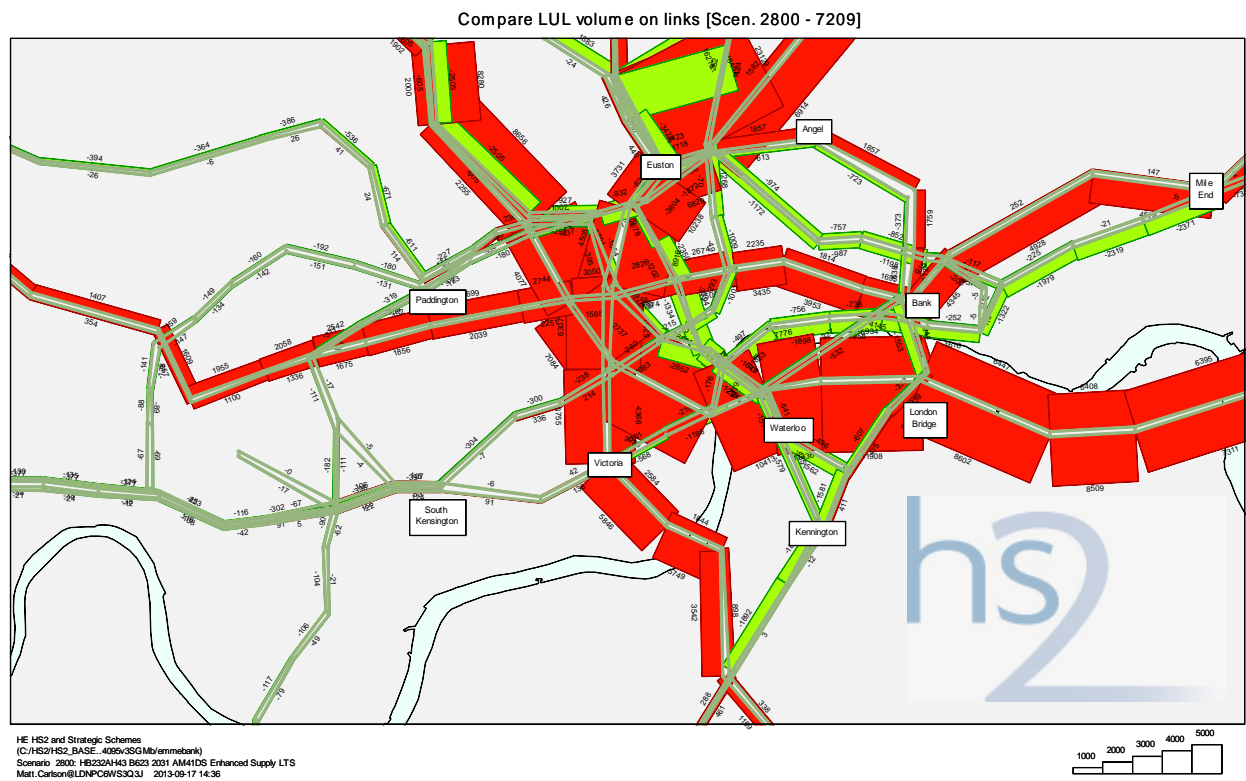


Figure 6-278: NR flow differences 2041 AM peak TfL capacity enhancements

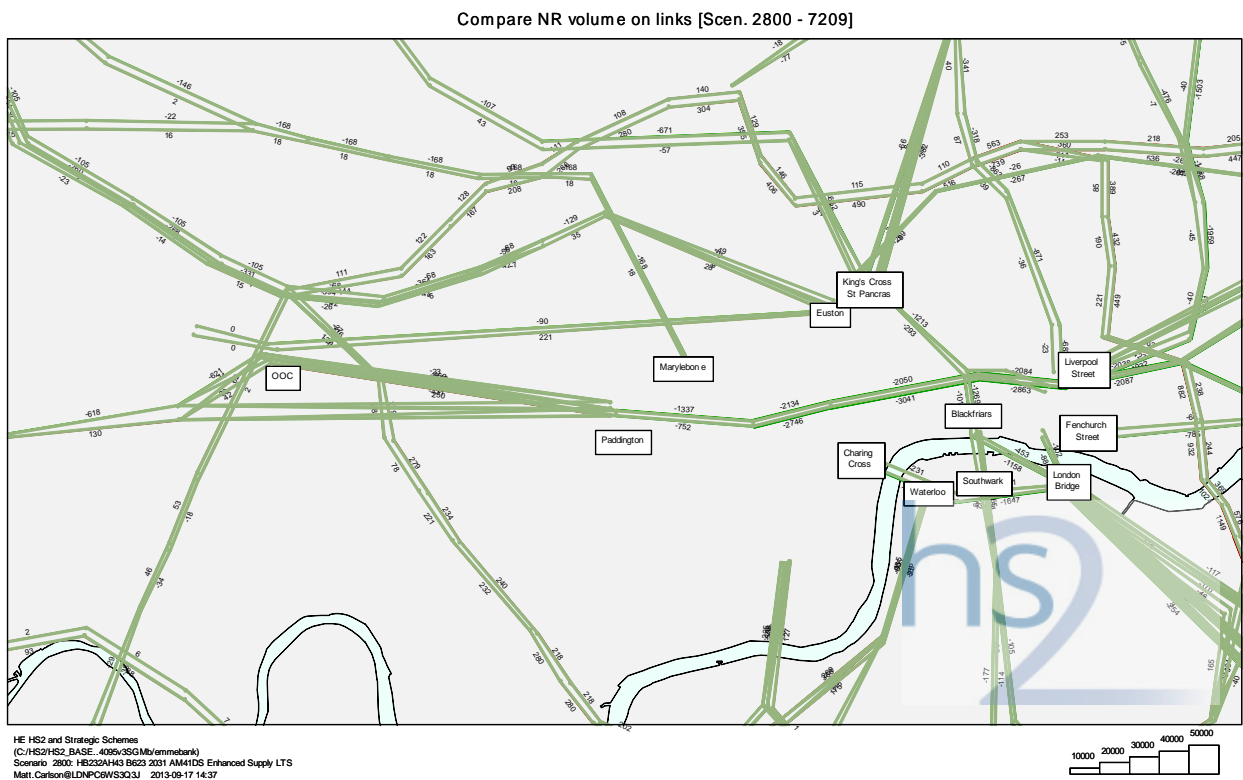
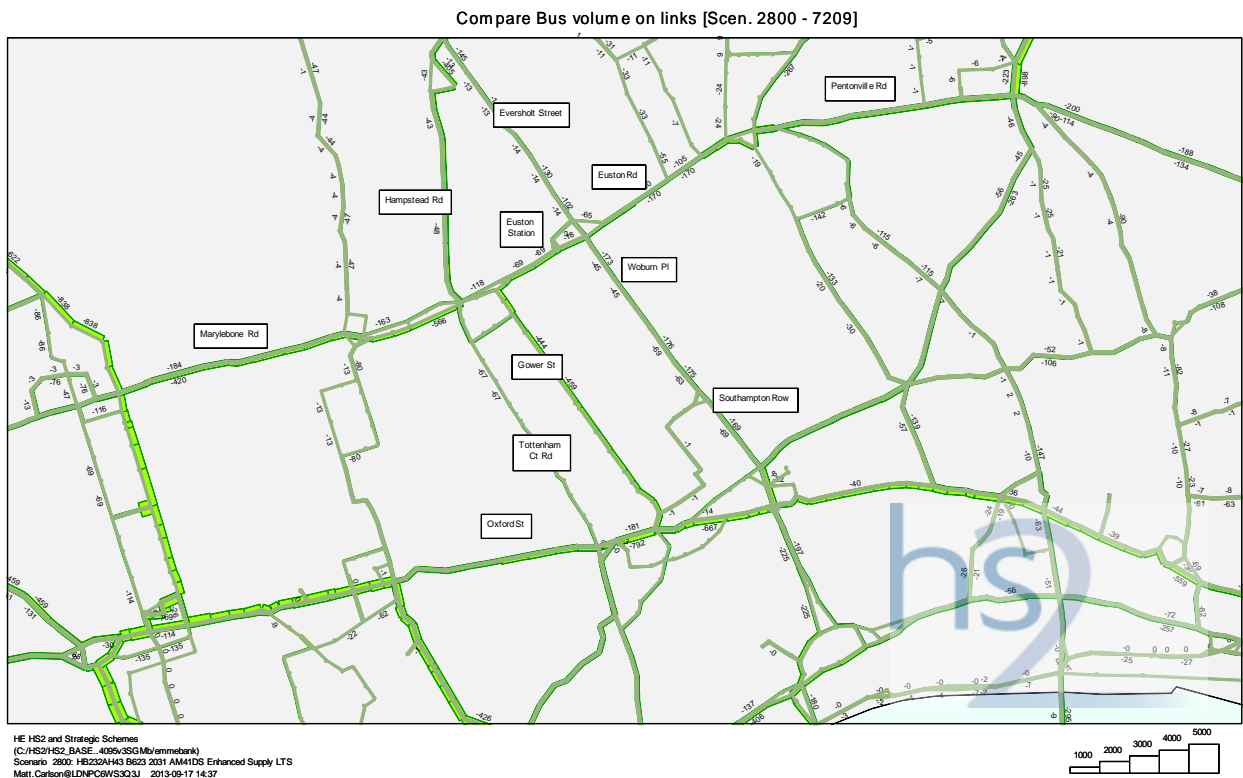


Figure 6-279: Bus flow differences 2041 AM peak TfL capacity enhancements



Impacts at Old Oak Common

- 6.10.117 Impacts of the Additional Supply Enhancements sensitivity test on Old Oak Common station interchange are minor with a very small decrease in overall movements. The primary drivers behind this are decreases in the number of trips interchanging to westbound GWML services and the number of trips leaving Old Oak Common station from westbound Crossrail services. The reason behind this are improved conditions for LU movements to access "competing" termini and the improvements to the Central Line meaning access to the Old Oak Common wider area is improved. Slightly more HS2 passengers alight at Old Oak Common as a result of these better connections.
- 6.10.118 This scenario has a marginal impact on bus loading across all routes, with a less than 5% drop in loading at the sections approaching/leaving Old Oak Common.

Impact on crowding

- 6.10.119 Crowding for NR and LU networks is shown in Figure 6-280 and Figure 6-281 and on Figure 6-282 to Figure 6-286 for individual lines. The various capacity enhancements relieve crowding to the next lowest band of crowding on several sections of the LU network including:
- Jubilee Line westbound between Canary Wharf and Westminster and southbound between Finchley Road and Green Park;
 - Northern Line Charing Cross branch southbound between Euston and Charing Cross;
 - Victoria Line southbound between Seven Sisters and Finsbury Park and Highbury & Islington and Kings Cross;
 - Central Line westbound between Liverpool Street and Bank;
 - Chiltern Line into Marylebone;
 - Crossrail through the central area; and
 - on services between Chingford and Liverpool Street.
- 6.10.120 Smaller reductions are evident on the Piccadilly Line southbound and the sub-surface lines westbound.

Figure 6-280: NR crowding 2041 AM peak TfL capacity enhancements

National Rail and Tramlink Crowding
Crowded_HB232AH43: Scenario 2850

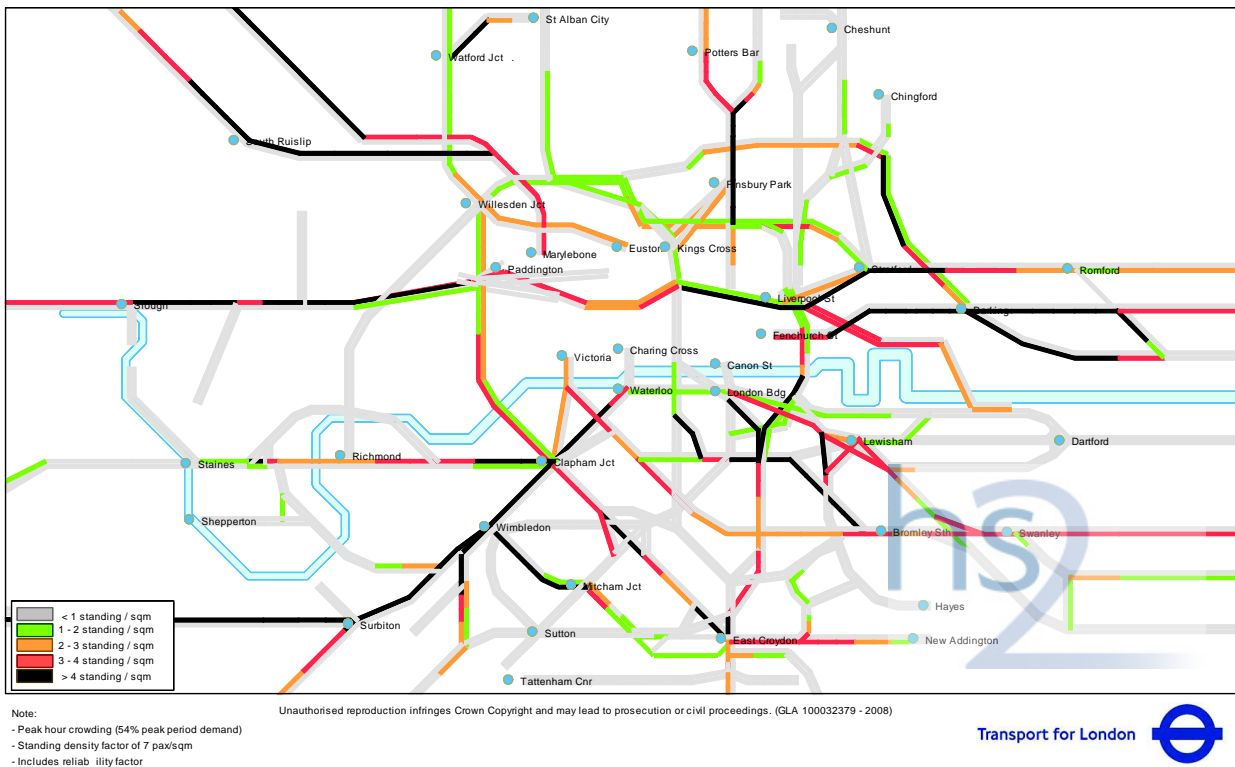


Figure 6-281: LU crowding 2041 AM peak TfL capacity enhancements

LUL and DLR Crowding
Crowded_HB238AH55: Scenario 2950

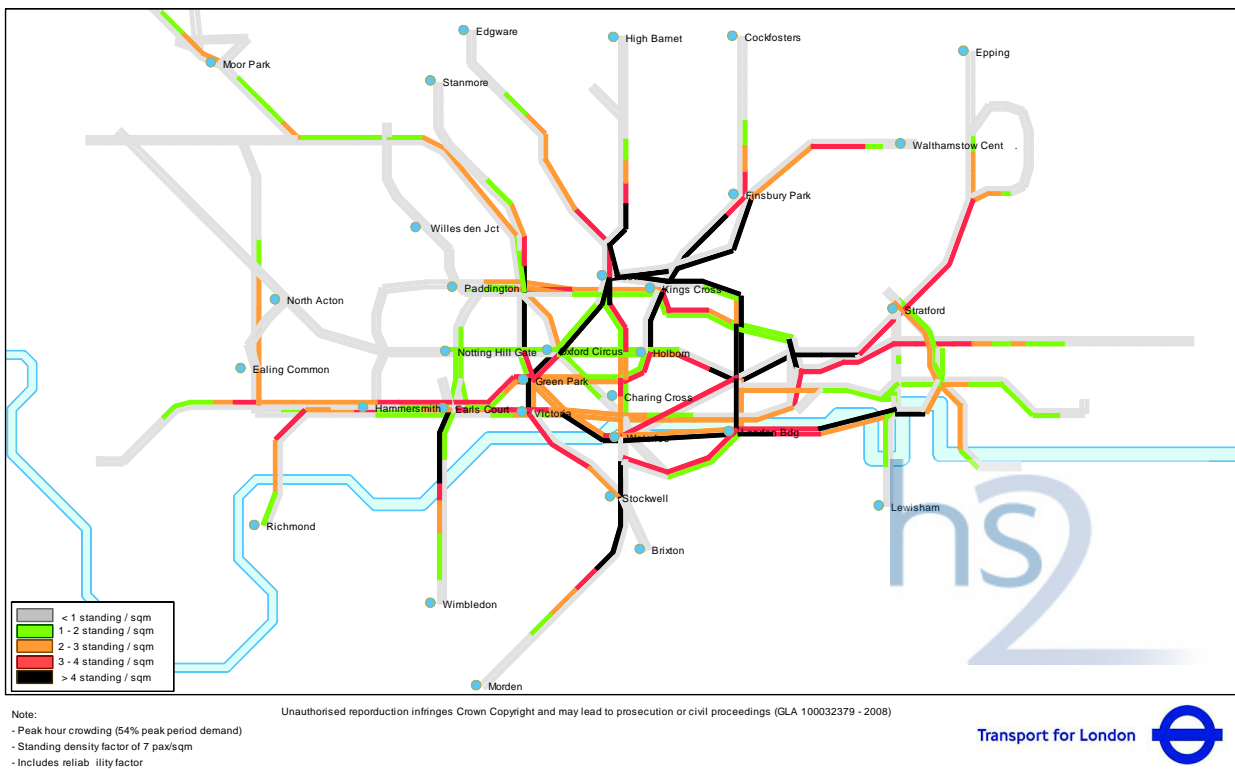


Figure 6-282: Line crowding AM 2041

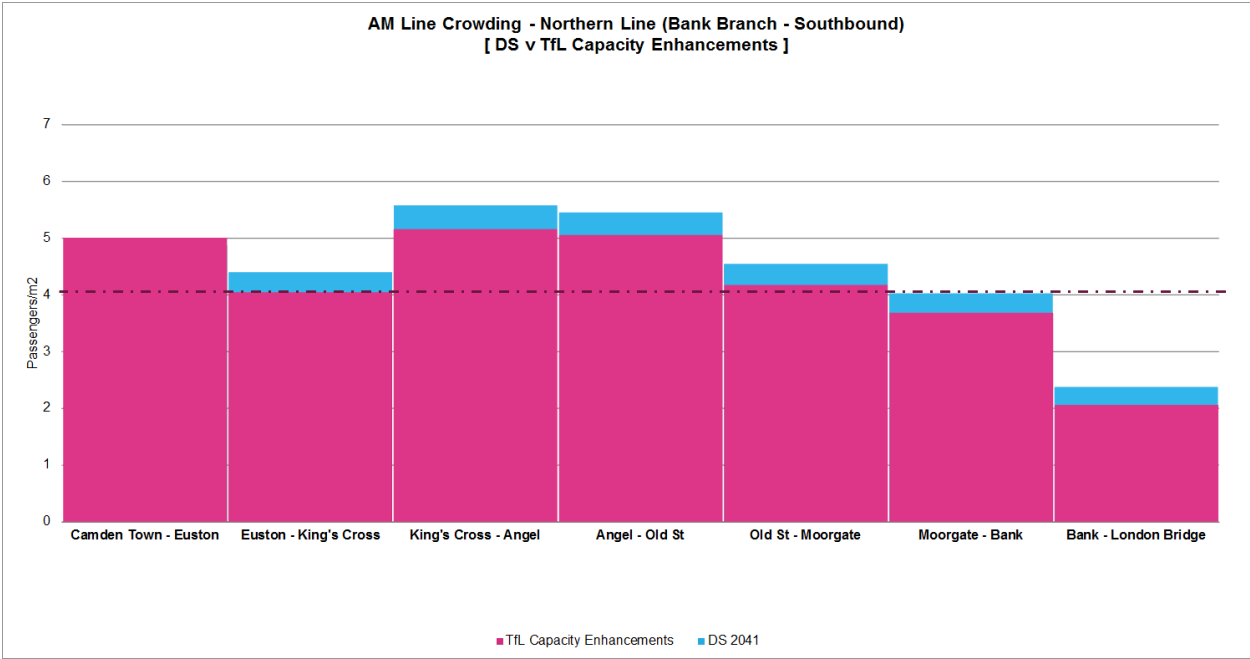


Figure 6-283: Line crowding AM 2041

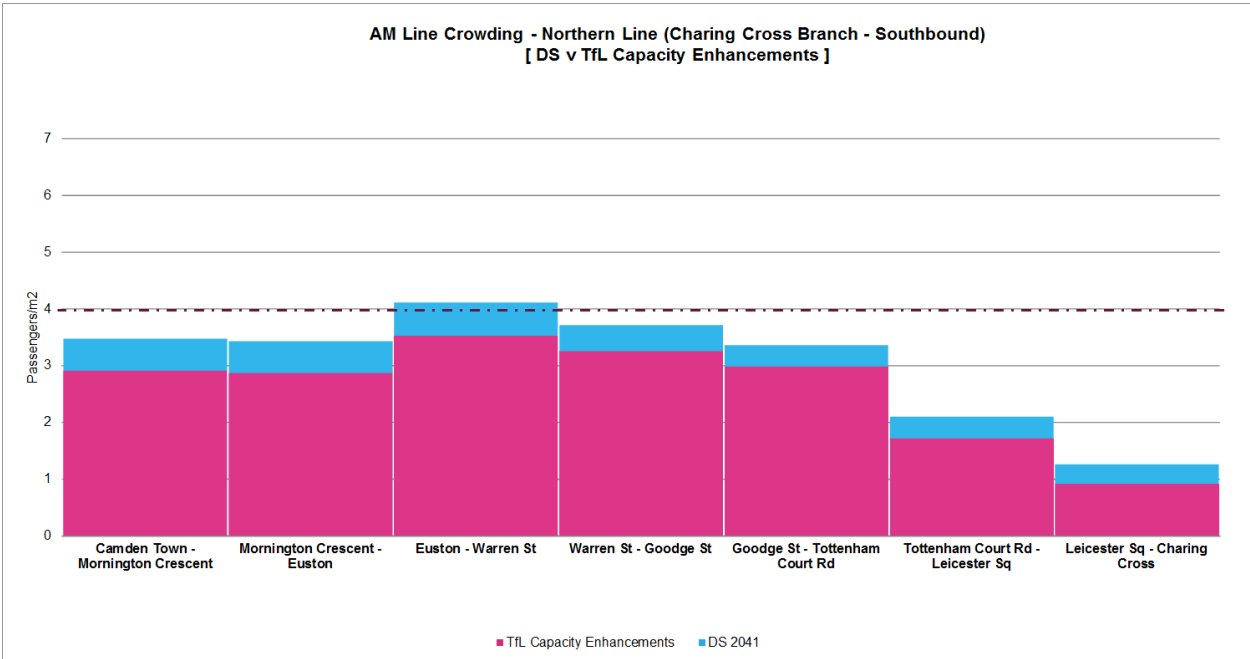


Figure 6-284: Line crowding AM 2041

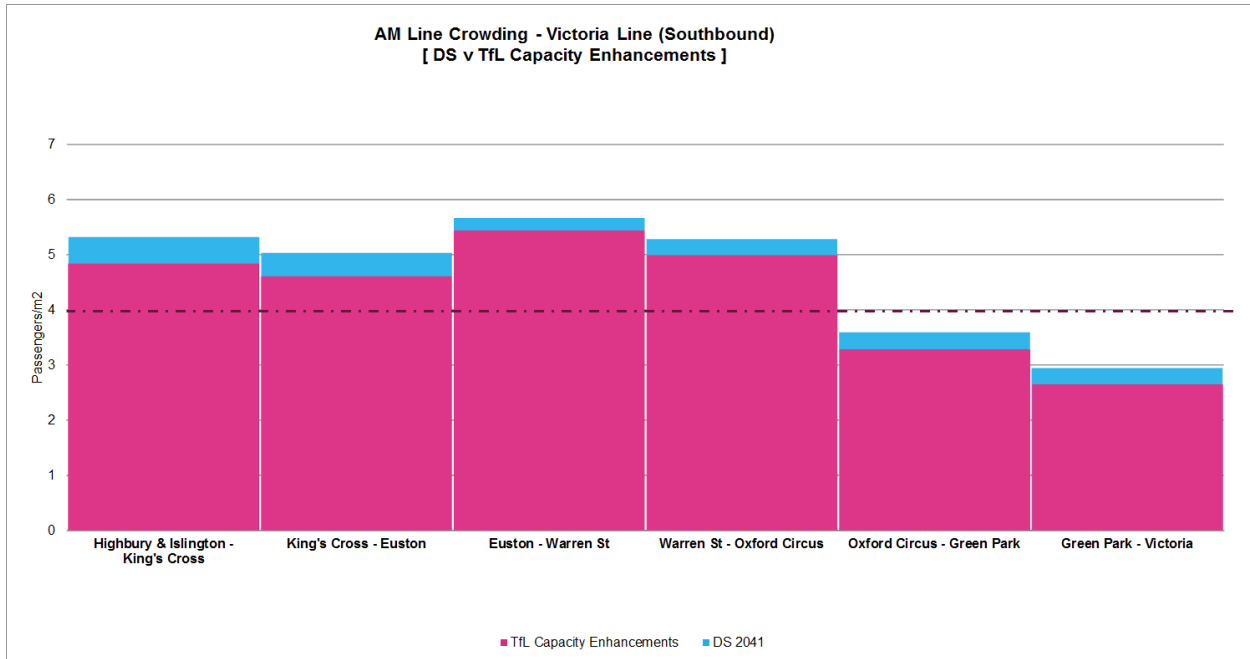


Figure 6-285: Line crowding AM 2041

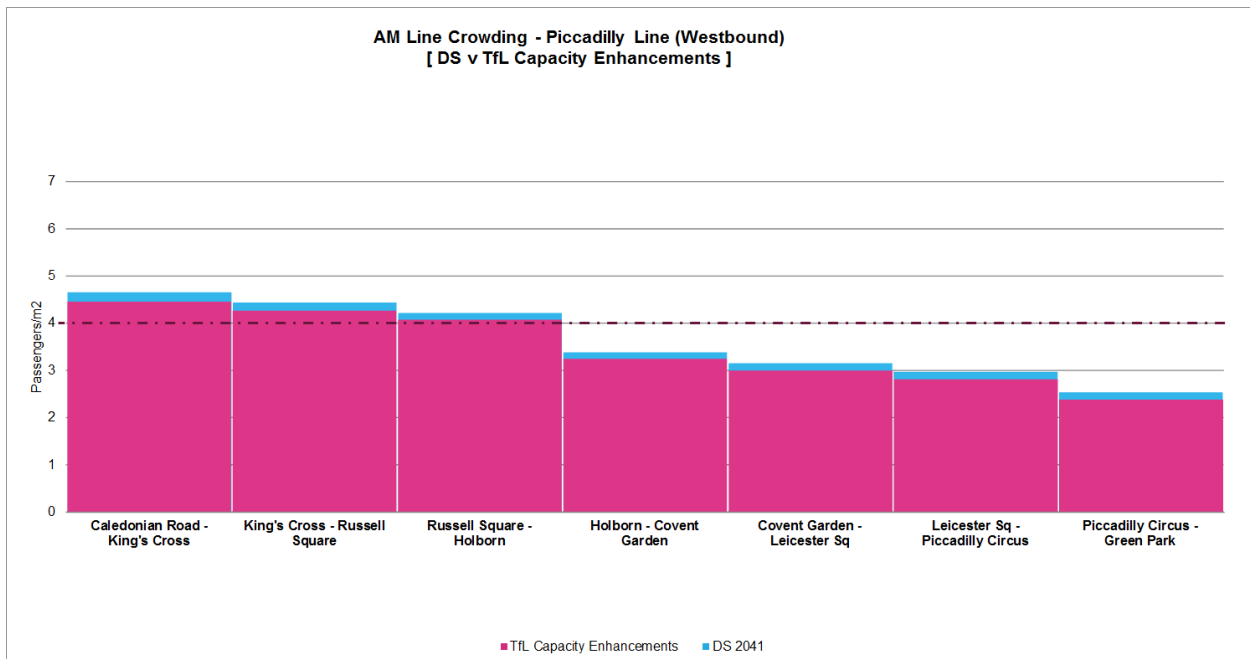
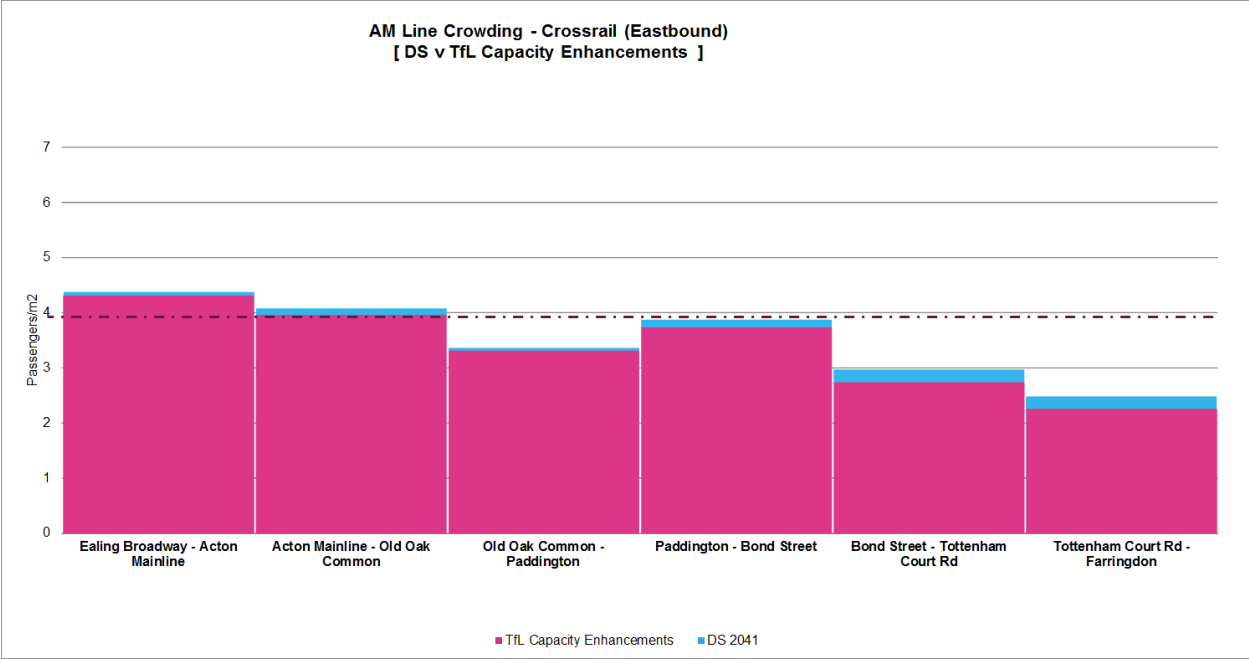


Figure 6-286: Line crowding AM 2041



Journey time impacts to HS2 passengers

6.10.121 HS2 passengers are forecast to save a total of 375 weighted hours between 07:00 and 10:00, as a result of increased frequencies and additional capacity provided on LU lines in central London.

Summary

6.10.122 Adding extra capacity to a number of lines in central London brings benefits that help alleviate over-crowding on LU services in central London. However, crowding on the Victoria and Northern (Bank branch) Lines remains at high levels.